Universal IR Learning Remote Module FAQ

Version 2.2

(For IR-210/IR-712A/IR-712-MTCP/IR-712P-MTCP)

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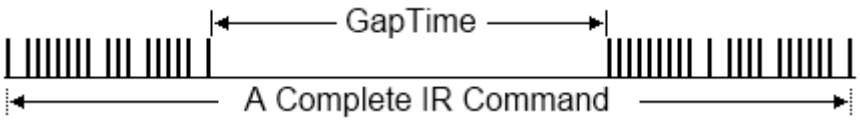
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Q01 : How to solve the problem of text cut off in the utility?

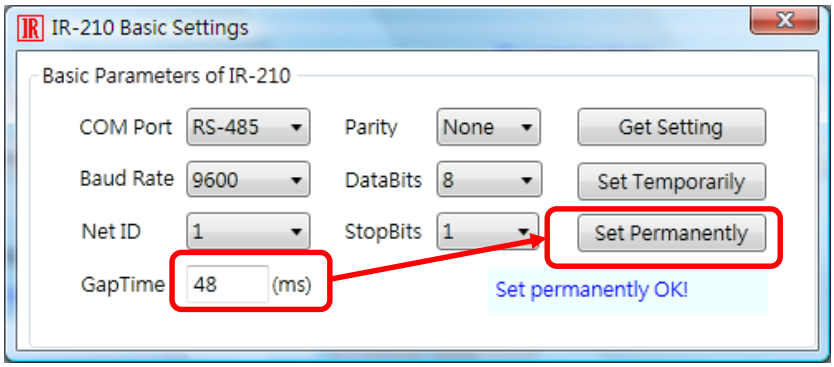
A01 : This problem is only existed in Windows XP if the font size is changed to “large font” for high display resolution. Please change the font size of the OS to “standard.”

Q02 : How to learn the Sharp-like IR commands of the devices successfully?

A02 : There is an space time of approximate 40 ms in the Sharp’s IR protocol. Please launch the utility of the IR learning remote module and go to the “IR-xxx Basic Settings” window (Menu->[Setting]->[IR-xxx Basic Settings]) to increase the “GapTime” to more than 40 ms. After that, the IR module can learn the IR commands successfully.



Space time of Sharp’s protocol is about 40 ms.



Set GapTime > 40 ms to learn Sharp IR protocol.

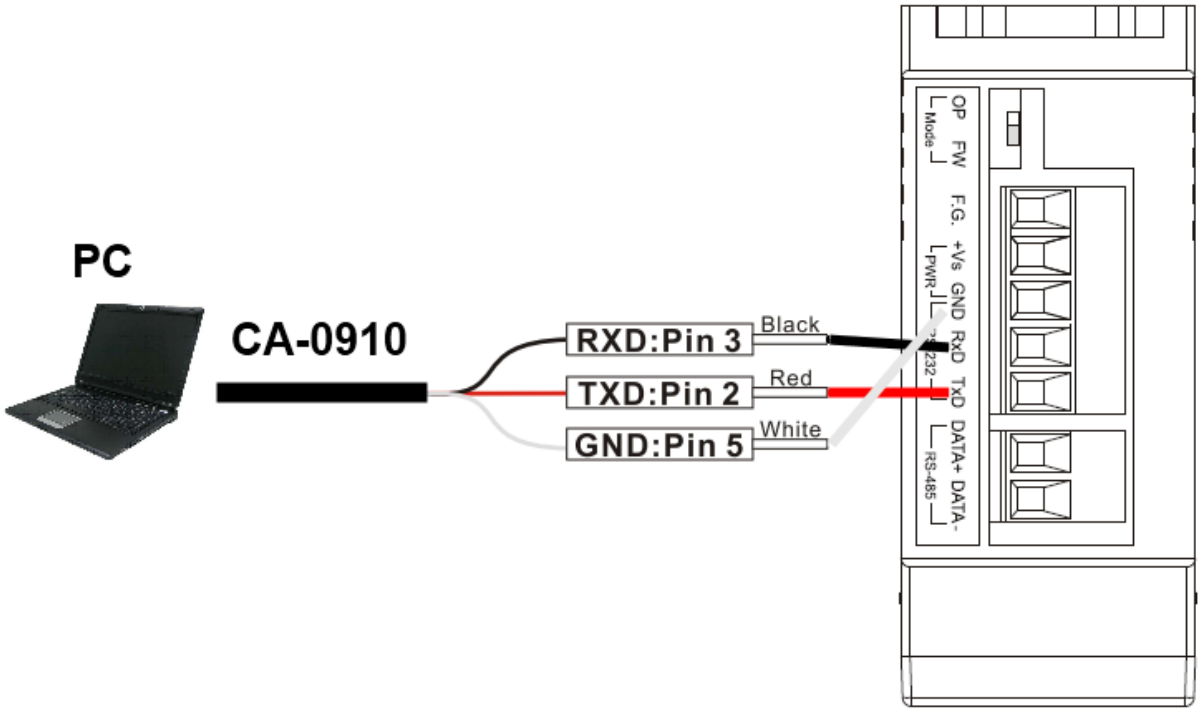
Q03 : Why can’t the utility connect to the IR learning remote module though the serial communication settings are correct?

A03 : Besides the serial communication settings of Baud rate, Parity, Data bits and Stop bits, it is necessary to consider two other factors: **Modbus Net ID** and **Serial Interface (RS-232/RS-485) which the IR learning remote module applies**. To determine the serial interface, restart the IR module and check the TR LED status in the first 3 seconds.

LED	IR-210/IR-712 Status	LED Status
TR	Use RS-232	Blinks 3 times after power-on
	Use RS-485	Turned on for 3 seconds after power-on
	Use RS-232 / RS-485	Blinks 3 times after power-on. For firmware version 1.20 and later, RS-232 & RS-485 port can be used without being configured by the utility.

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If the RS-232 cable **CA-0910** was connected to the IR learning remote module，please notice that the Rx/Tx/GND pins of the CA-0910 should be connected to the Rx/Tx/GND of the IR module's RS-232 port accordingly as shown in the following figure.



Wire connection of the CA-0910 to the IR-210

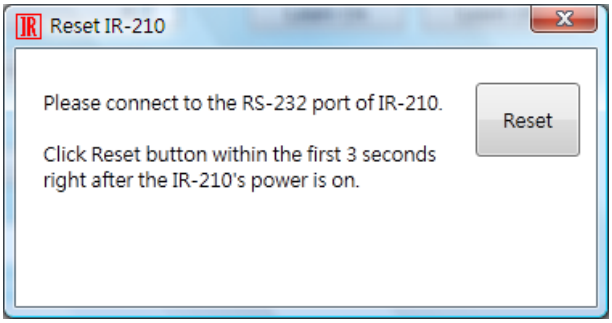
When the USB-to-RS-232/485 converter was used with PC, please also confirm if the IR utility opens the right COM port.

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Q04 : How to reset IR learning module to the default serial communication settings?

A04 : Please follow the steps below to reset serial communication settings:

1. Change the wire connection to the RS-232 port of IR learning remote module.
2. Open the PC COM port connected to the IR module in the utility with arbitrary communication settings.
3. Click menu [Setting]->[Reset Basic Settings on IR-xxx] to open the reset window.



4. Click the “Reset” button within 3 seconds after restarting (i.e. power cycling) the IR module. If the reset is successful, a “Reset OK” window will pop up to show that the IR module is now changed to default serial communication settings **temporarily,** which means the settings will be restored to previous ones after cycling the power. To avoid it after power cycle, please go to the **“IR-xxx Basic Settings” window** (Menu->[Setting]->[IR-xxx Basic Settings]) to set the settings by clicking the **“Set Permanently”** button.

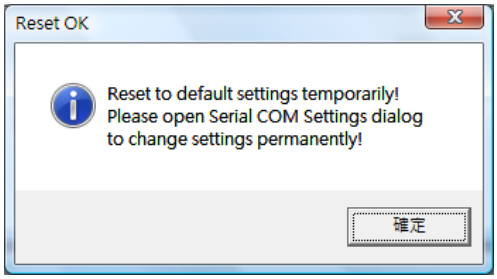


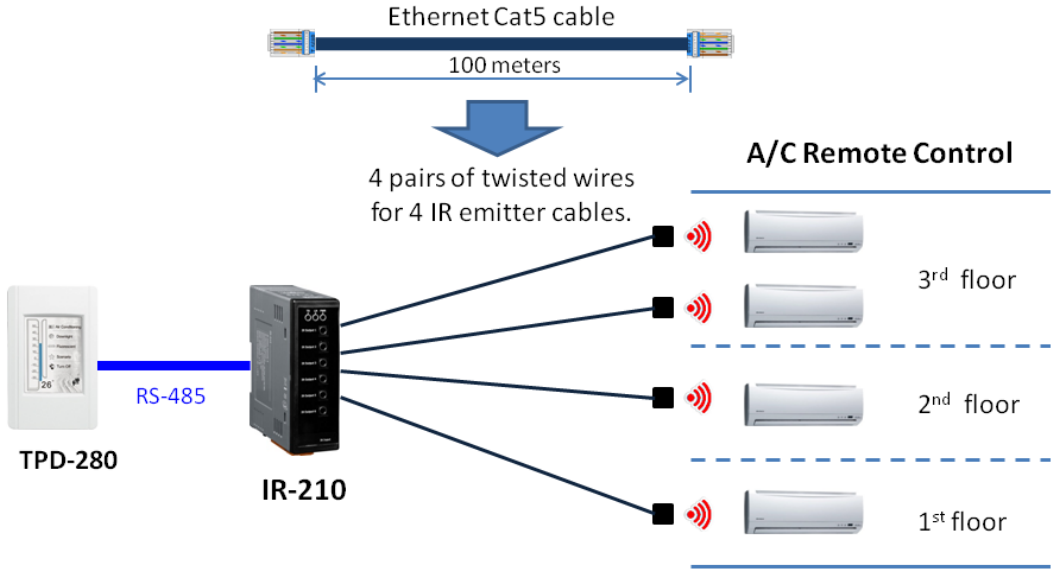
Table of IR-210 Default Communication Settings

Item	Default
COM port	RS-232
Baud rate	115200 bps
Parity	None
Data bits	8
Stop bits	1
Modbus ID	1

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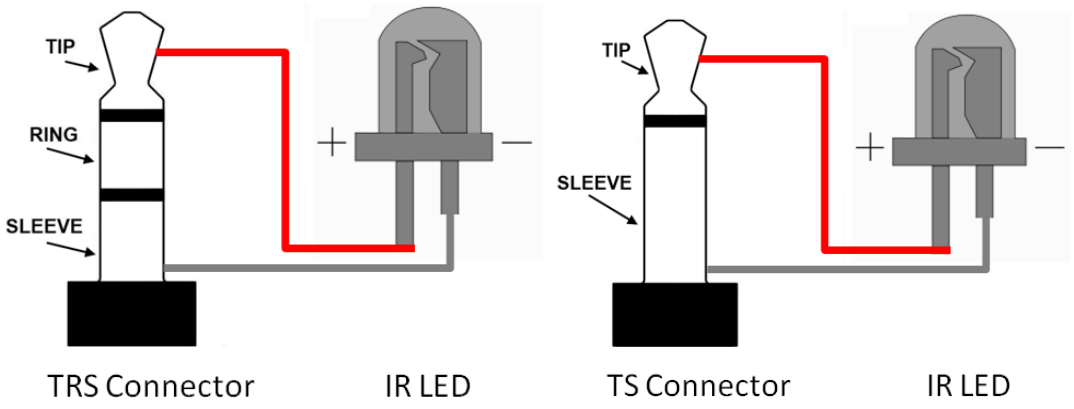
Q05 : What is the maximum length of the IR emitter cable for the IR-210/IR-712A?

A05 : It depends on the resistance and length of the cable. There is a DIY example of using IR emitter cables with 100 meters long. Four IR emitter cables can be made from an Ethernet Cat5 cable with 4 twisted pair cables. They are applied to the application of controlling 4 air conditioners in a luxurious mansion. The application diagram is as follows.



The length of the IR emitter cables (CA-IR-SH225x & CA-IR-SH225x-5) provided by ICP DAS are all 2.5 meters long. It is suggested to make the cables yourself if there is demand for a longer length. The audio cable can be applied to extend the distance. For a longer distance like 100 meters, an Ethernet cable is a suitable choice.

It is also noticed to buy the IR emitter diode (IRED) with IR wavelength 940 nm which is commonly used in the consumer electronics. Please refer to the manual (Sec. 2.4.3) for the wire connection among the IRED, the cable and the 3.5 mm audio jack plug, or as depicted in the following figures.



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Q06 :How to build IR remote application with the ICP DAS's ISaGRAF PAC?

A06 :

Regarding the IR remote control with the ISaGRAF PAC, please refer to the link.

Please also refer to the ISaGRAP FAQ-152 for more details.

Q07 :Why can't WISE-5800 controller connect to IR-712A?

A07 :

Please set the parameter "Modbus commands response delay time" of the IR-712A to 3 ms (default = 1 ms) by IR-712A utility.

Steps:

IR-712A Utility's menu [Setting] => [IR-712A Basic Settings] => [MB Cmd Resp Delay Time = 3 ms] => [Set Permanently]

Q08 :How to configure the communication to the IR-210/IR-712A in the WISE-5800?

A08 :

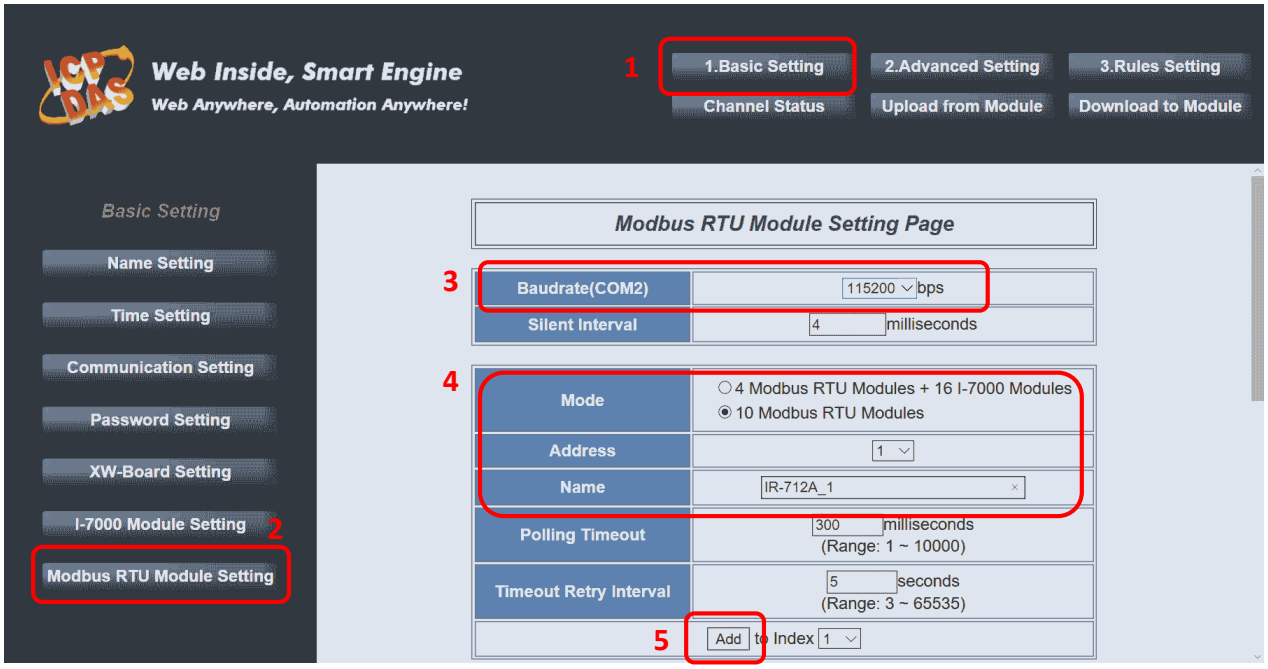
Take the IR-712A as an example.

- **Communication Wire Conneciton**

  The WISE-5800 connects to the IR-712A by the RS-485 bus.

- **Web configuration of the WISE-5800**

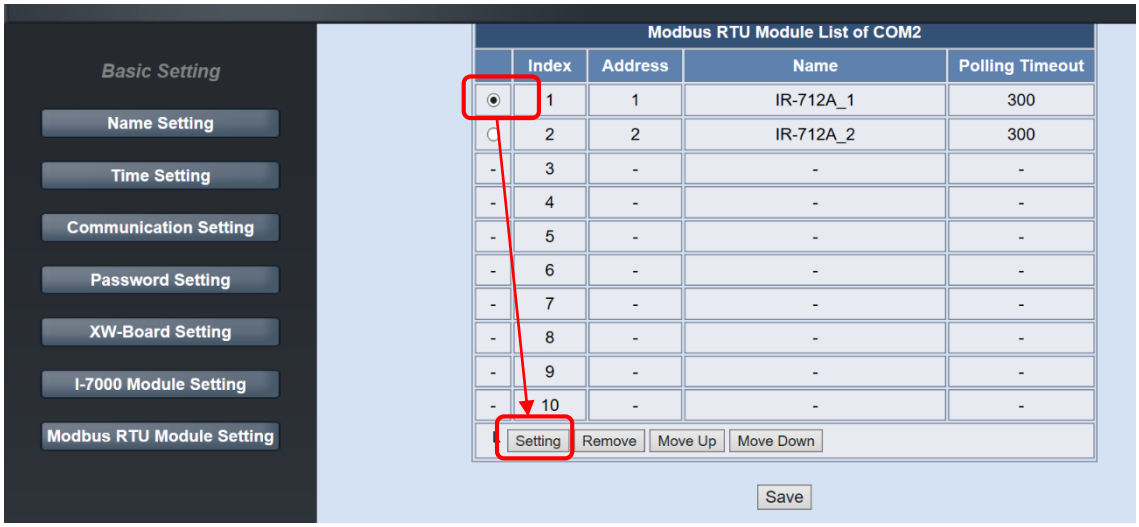
(1) Press "1.Basic Setting" Button and "Modbus RTU Module Setting" button to show the page. Set the Baud, Mode, Address and Name for communication to the IR-712A. Then, press "Add".



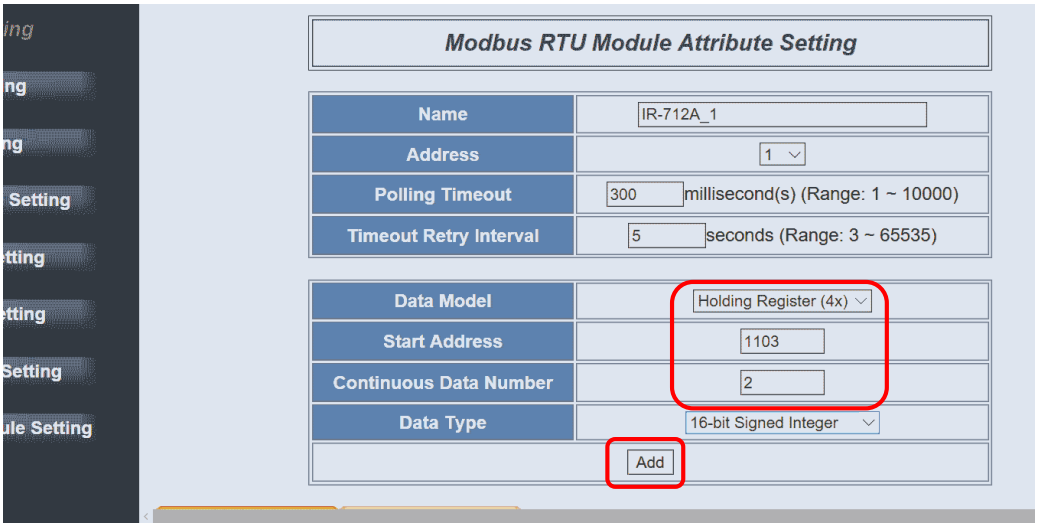
(2) Add an IR-712A devices (IR-712A_1) as follows. Press "Setting" button for the IR-712A to set

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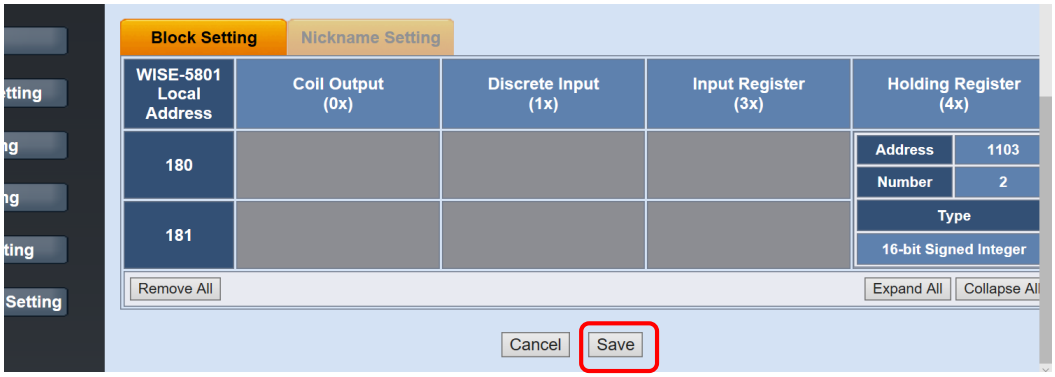
up the Modbus register address.



(3) In the Attribute Setting page, set the Data Model = ”Holding Register”, Start Address = ”1103”, and Continuous Data Number = ”2”. Then, press “Add” button. (Note: Refer to the IR-712A manual for the Modbus register address (chapter 5))



(4) Check to table at the bottom and press “Save” button.



The WISE-5231 with built-in IR-210/IR-712A/IR-712-MTCP communication configuration is also

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recommended.

Q09 : How to integrate IR-712A with TouchPAD?

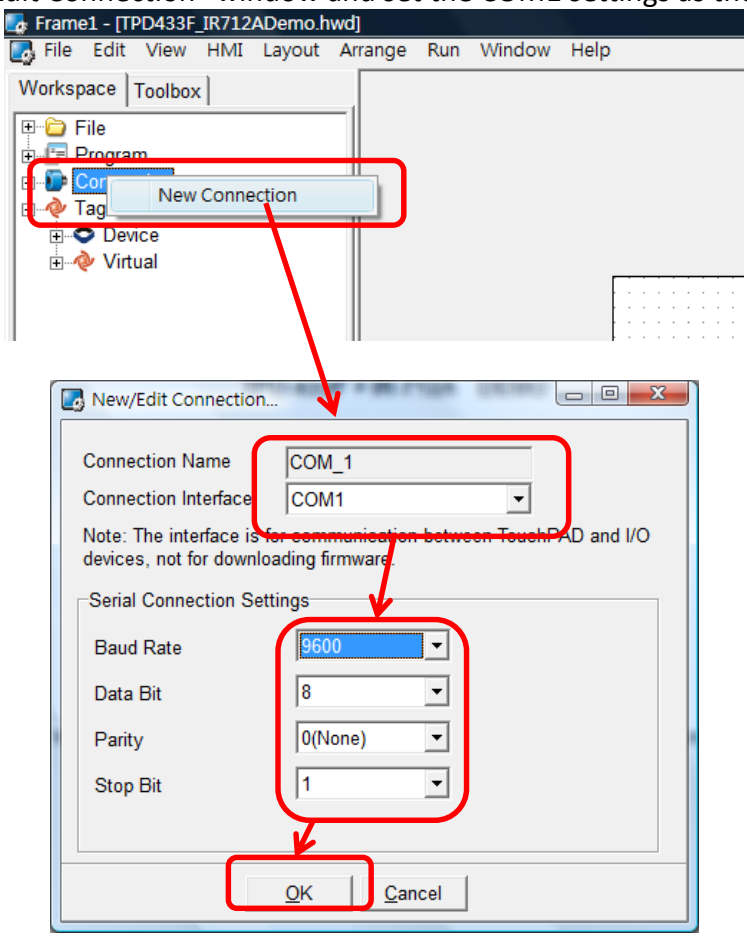
A09 :

The following uses TPD-433F project to explain how to develop the TouchPAD project with ladder and C language to realize the control on the IR-712A (IR-210 also applies).

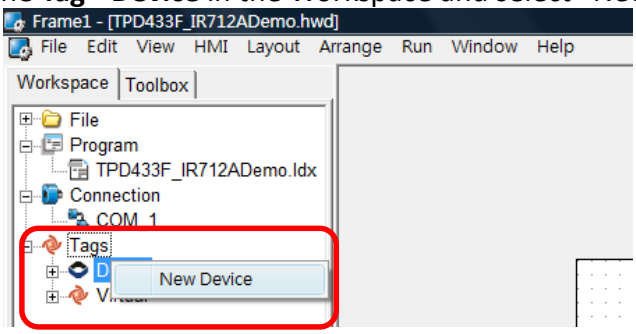
A. Ladder Diagram Programming

Steps:

1.Use mouse to right-click the “Connection” item in the Workspace tab. Select “New Connection” to open the “New/Edit Connection” window and set the COM1 settings as the following figure.



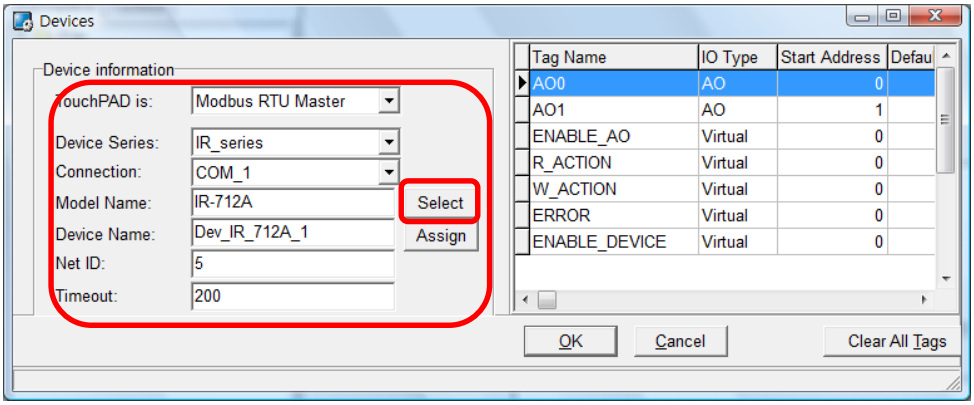
2. Mouse right-clicking the **Tag->Device** in the Workspace and select “New Device”.



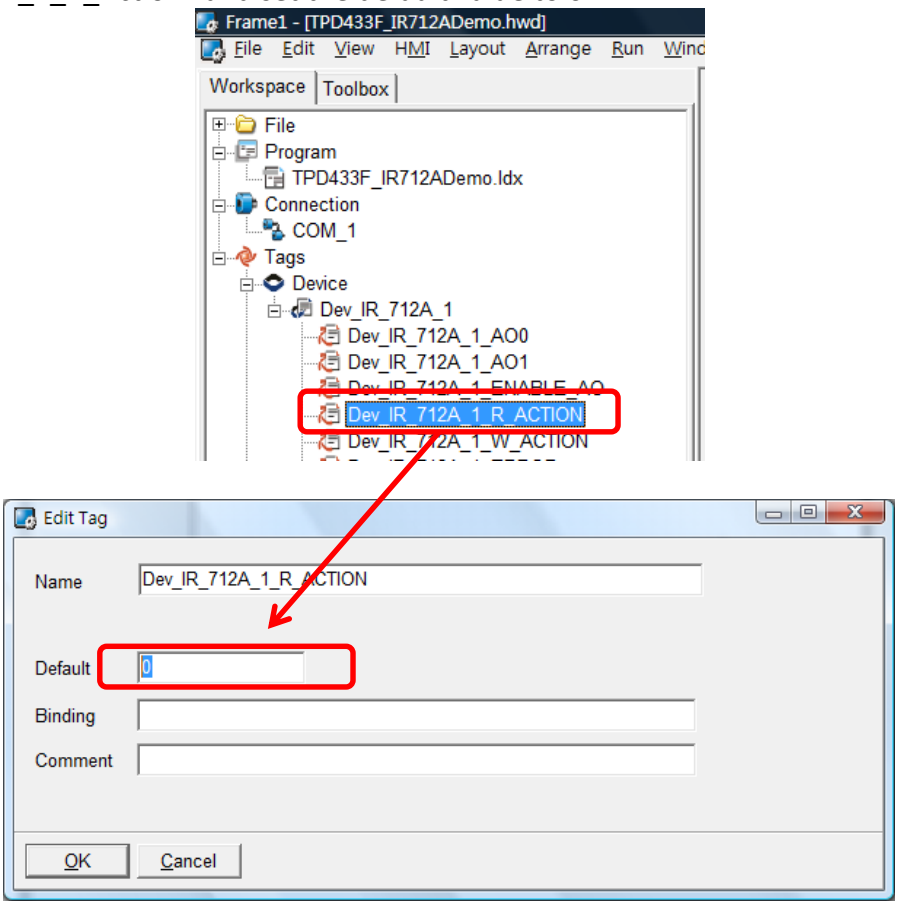
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In the Device Information section of the Device window, set the parameters as follows:

TouchPAD is:	Modbus RTU Master
Device Series:	IR_series
Connection:	COM_1
Model Name:	IR-712A
Net ID:	Net ID of the IR-712A

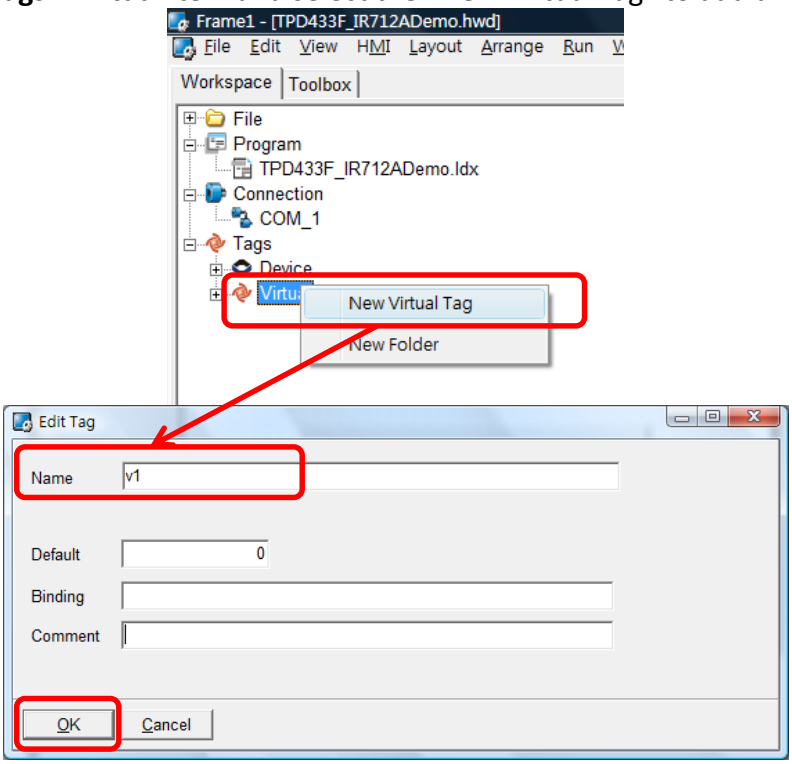


3. Back to the Workspace and go to the **Tags->Device->Dev_IR_712A_1** item. Right-clicks the tag "Devf_IR_712A_1_R_Action" and set the default value to 0.

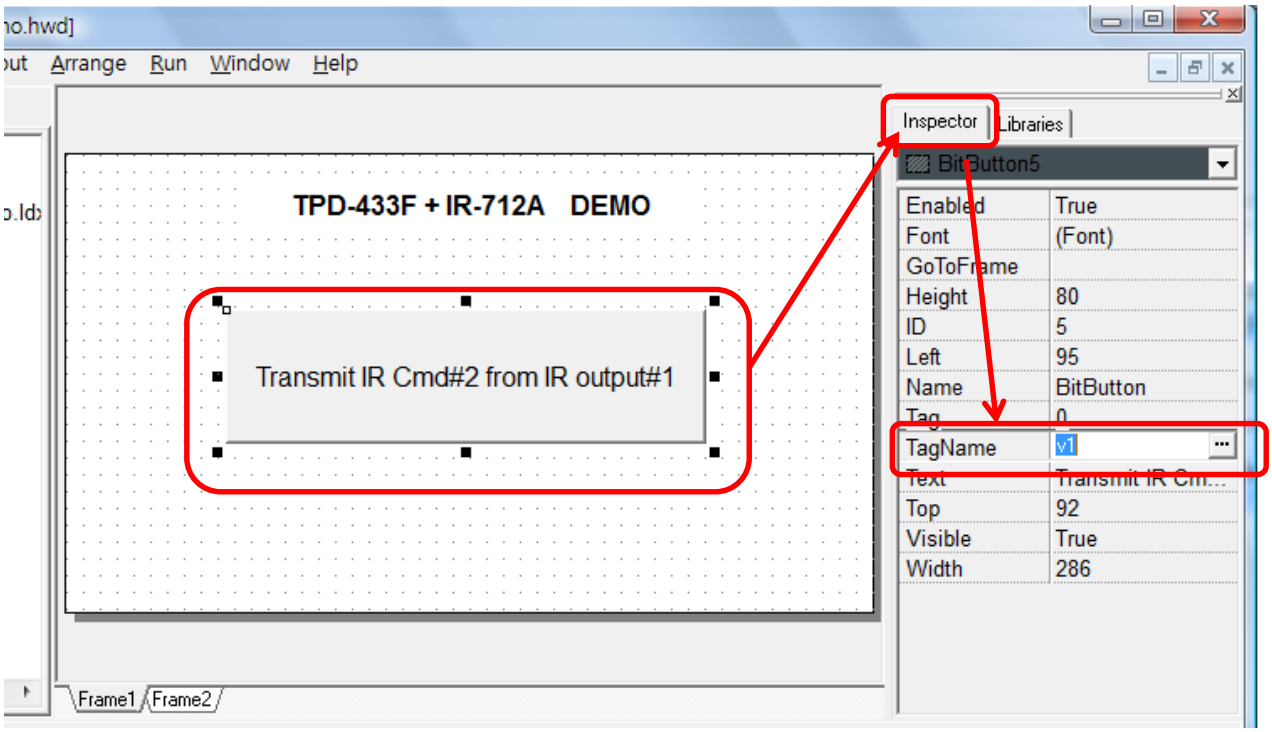


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4. Right-click the **Tags->Virtual** item and select the "New Virtual Tag" to add a **v1** Tag.

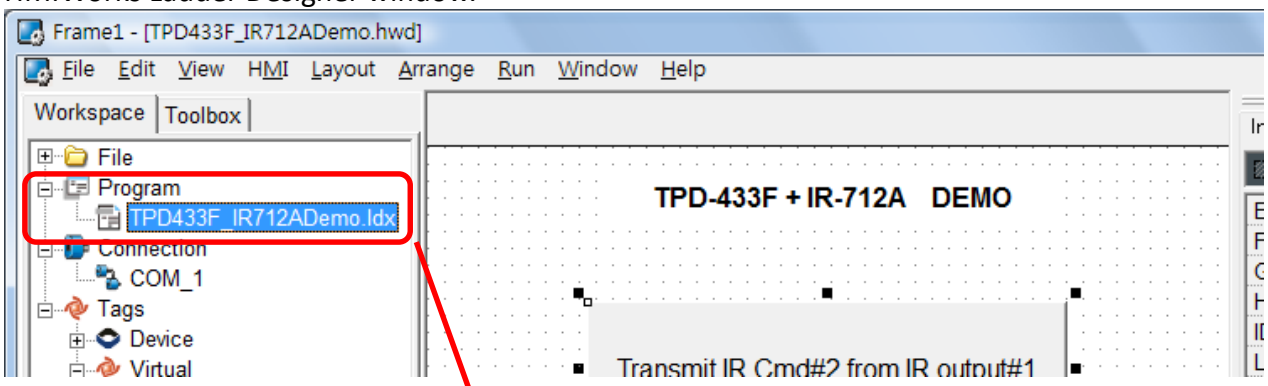


5. Add a BitButton control in the display section of the TPD-433F. Set the TagName property on the button to v1.



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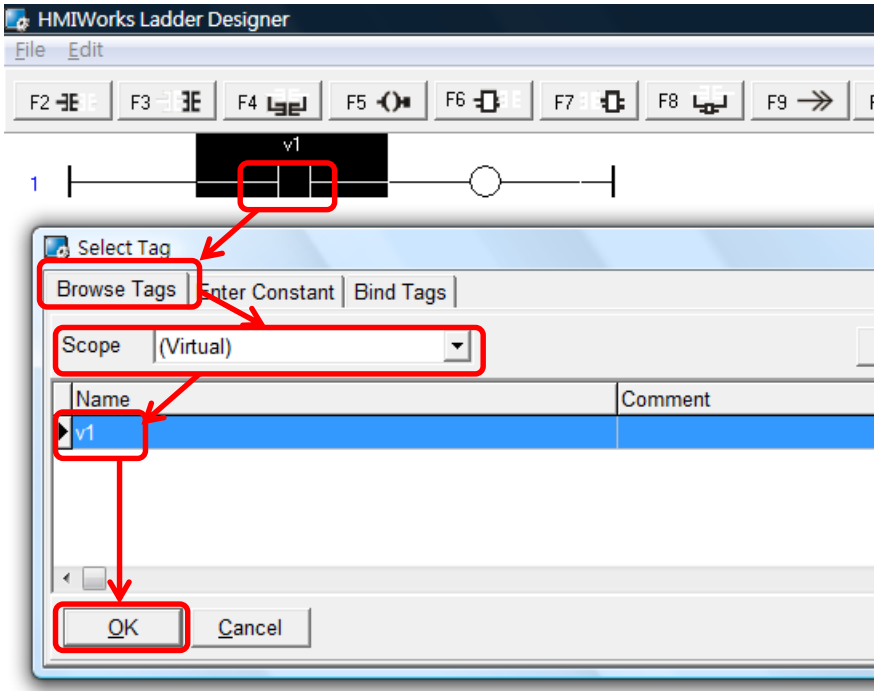
6. Open the "Program" item in the workspace and double-click the Idx file to open the HMIWorks Ladder Designer window.



Press F2 button to add a normally open contact.

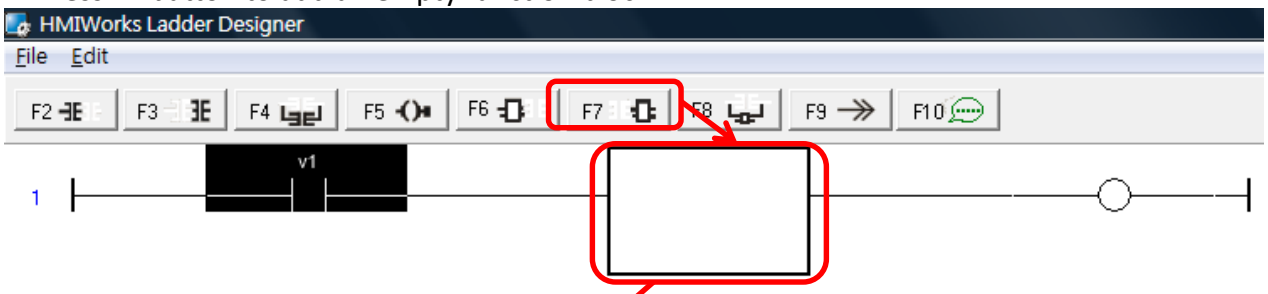


Double-click the normally open contact and set **v1** tag to the contact.

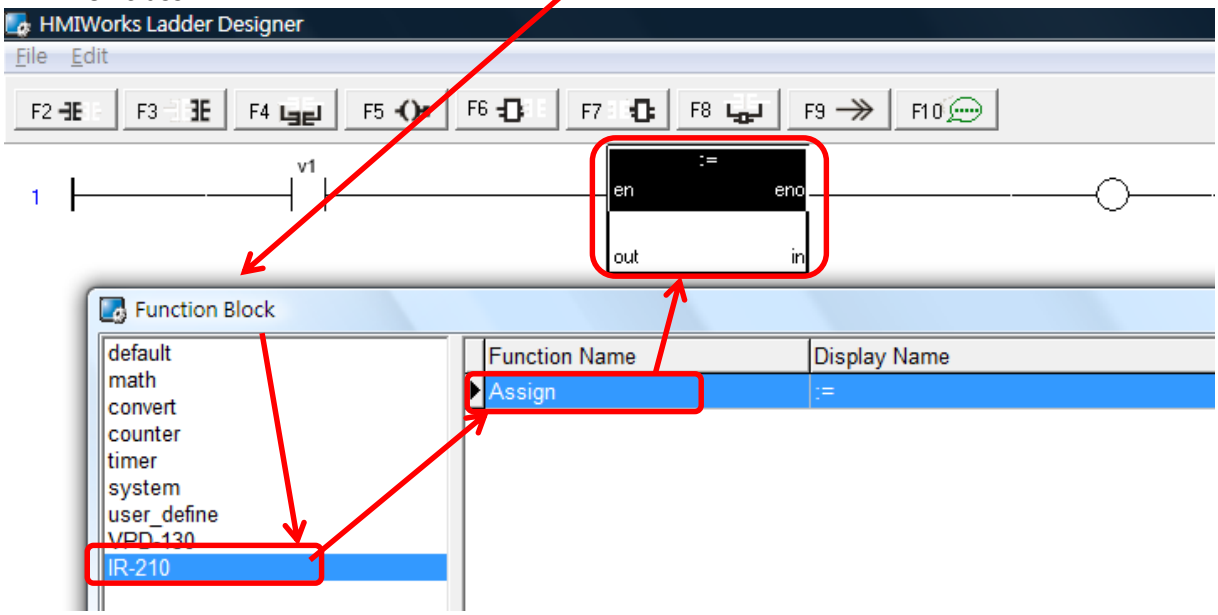


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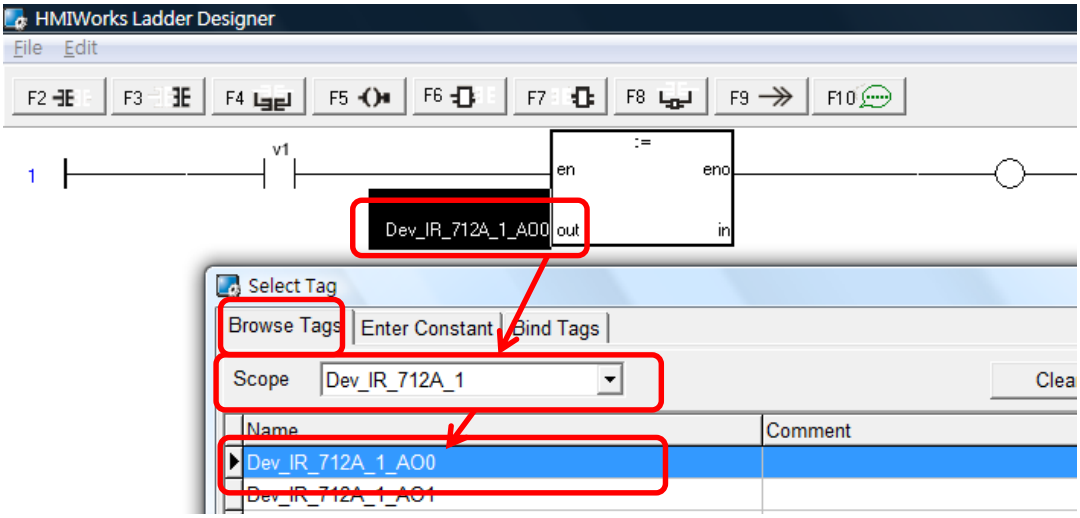
7. Press F7 button to add an empty function block.



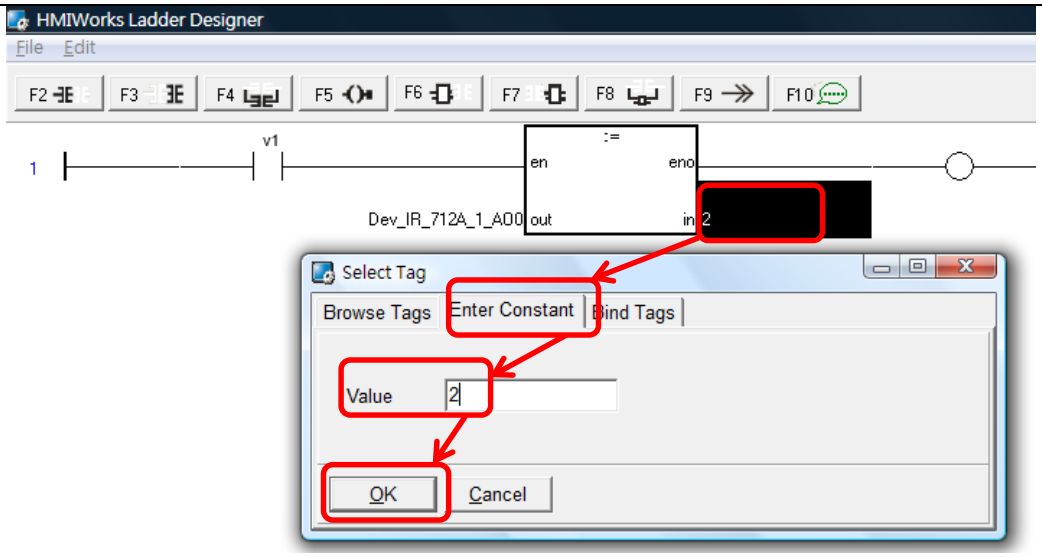
Double-click the function block to open the window and select the "**Assign**" function in the "**IR-210**" class.



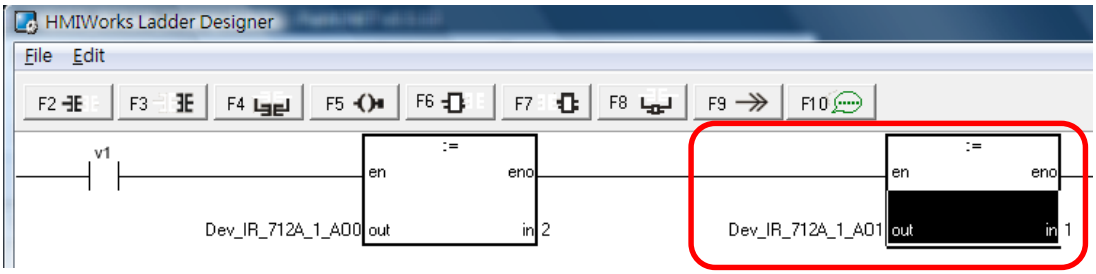
Set the out and in of the "Assign" function block to "Dev_IR-712A_1_AO0" and "2", where "2" means IR command number 2.



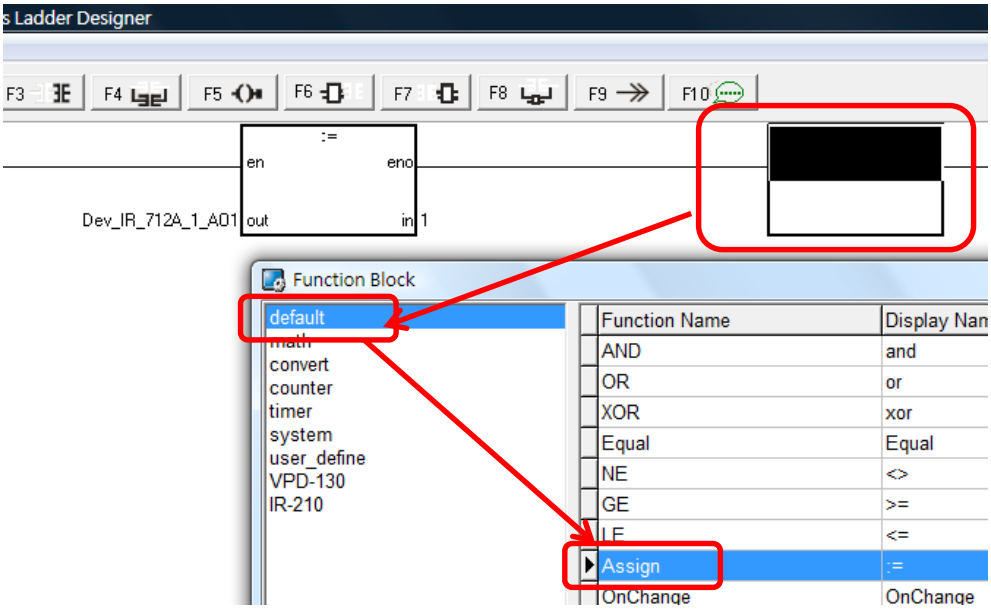
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8. Please follow step 7 to add another “Assign” Function block. This time, set the out and in of the “Assign” function block to “Dev_IR-712A_1_AO1” and “1”, where “1” means IR Output 1.

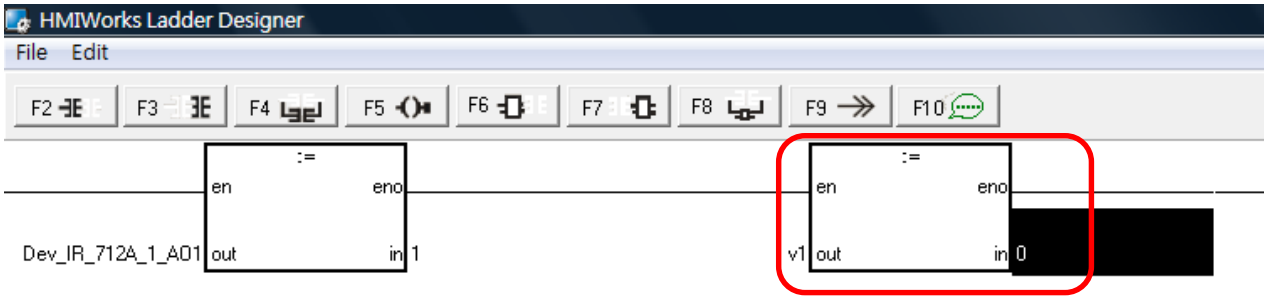


9. Add an empty function block at the right side of the “Assign” FB in step 8. Double-click the empty function block to open the window and select the “Assign ” function in the “default” class.

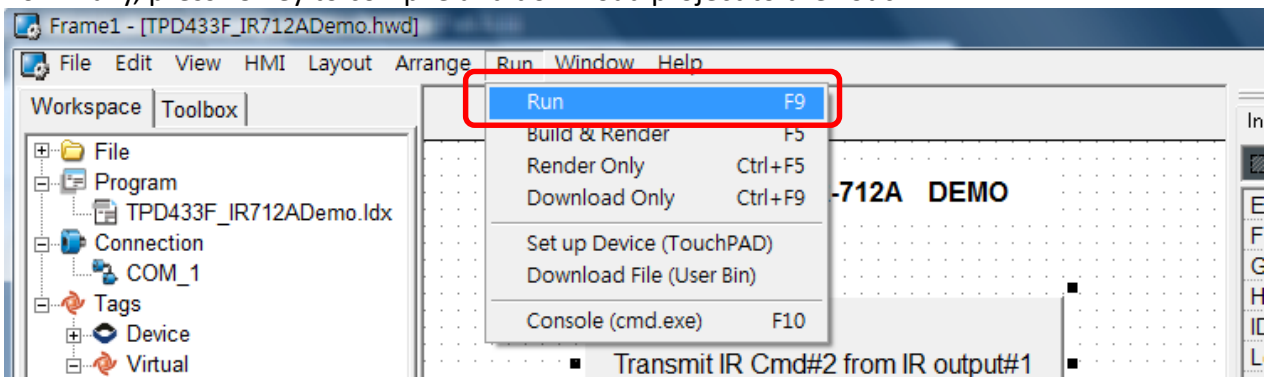


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Set the out and in of the Assign function block to v1 and 0 correspondingly. Save file and close the ladder designer.



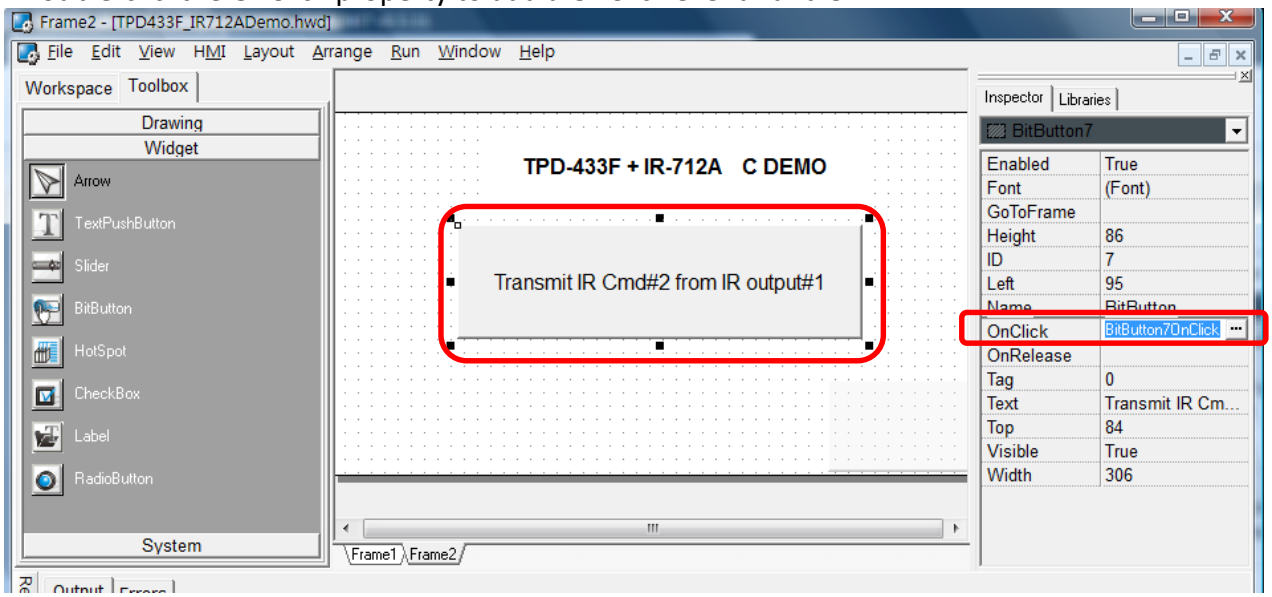
10. Finally, press F9 key to compile and download project to the TouchPAD.



B. C Language Programming

Steps:

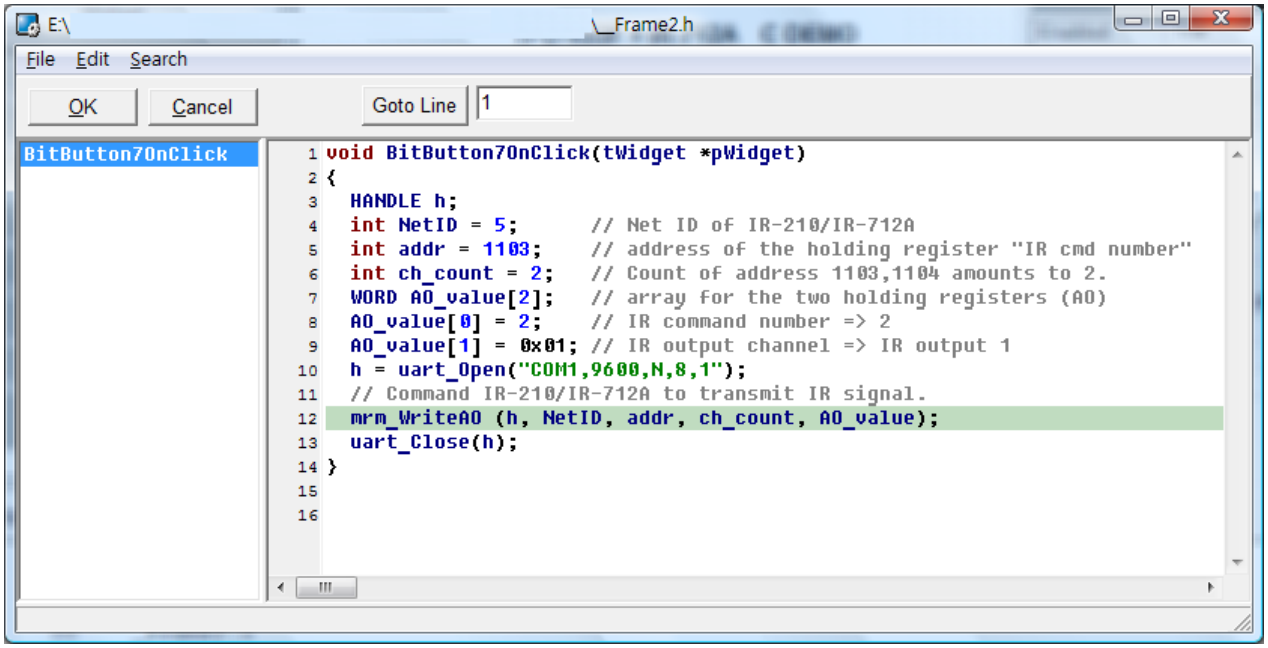
1. Please refer to step 1 to 3 of "**A. Ladder Diagram Programming**".
2. Add a BitButton control in the display section of TPD-433F in the HMIWorks IDE.
   Double-clickthe OnClick property to add a OnClick event handler.



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3. Copy the following C code to the OnClick event handler. It sends Modbus command to IR-712Aand write data to address 1103(IR command number) and 1104(IR output channel) of holding registers.

```
void BitButton7OnClick(tWidget *pWidget)
{
  HANDLE h;
  int NetID = 5;      // Net ID of IR-210/IR-712A
  int addr = 1103;    // address of the holding register "IR cmd number"
  int ch_count = 2;   // Count of address 1103,1104 amounts to 2.
  WORD AO_value[2];   // array for the two holding registers (AO)
  AO_value[0] = 2;    // IR command number => 2
  AO_value[1] = 0x01; // IR output channel => IR output 1
  h = uart_Open("COM1,9600,N,8,1");   // Open COM1 (RS-485) of TPD-433F
  // Command IR-210/IR-712A to transmit IR signal.
  mrm_WriteAO (h, NetID, addr, ch_count, AO_value);
  uart_Close(h);      // Close COM1 of TPD-433F
}
```



4. Press F9 key to compile and download the project to the TouchPAD.

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Q10 : What is the maximum remote control distance of the IR modules?

A10 :

Generally speaking, it can be 7~8 meters at least if using CA-IR-SH2251 with the IR learning remote modules (IR-210/712A). However, it depends on the application condition and the surroundings. There are some possible factors to inference the range of remote control distance:

(1) The length of the IR emitter cable. The longer the IR cable is, the shorter the distance of remote control.

(2) The sensitivity of the IR receiver of the controlled appliances.
The receive angle to the IR receiver also affects the distance. The larger the angle is, the shorter the distance of remote control.

(3) The interference from the sun light, (compact) fluorescent lamps, LCD/PDP TV, …, etc.

There is a case which is 10 meters long for the IR-712A + CA-IR-SH2251.

Q11 : How to avoid the IR emitter cables interference by the neighboring VGA cable?

A11 :

The high frequency noises from the VGA cables or other devices may interfere the signals in the IR emitter cables. It is proposed to add ferrite (magnet) cores near the head and jack plug of the IR emitter cable, as shown in the following pictures, to suppress the interference.







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Q12 : How to apply the IR learning commands to multiple IR learning modules ?

A12 :

IR learning commands can be saved to an IR leaning data file with file extension “ird” for backup by the IR utility. Users can download the IR leaning data file to multiple IR leaning modules by the IR utility without the IR learning process again. The configuration works on RS-232 and RS-485 interface.

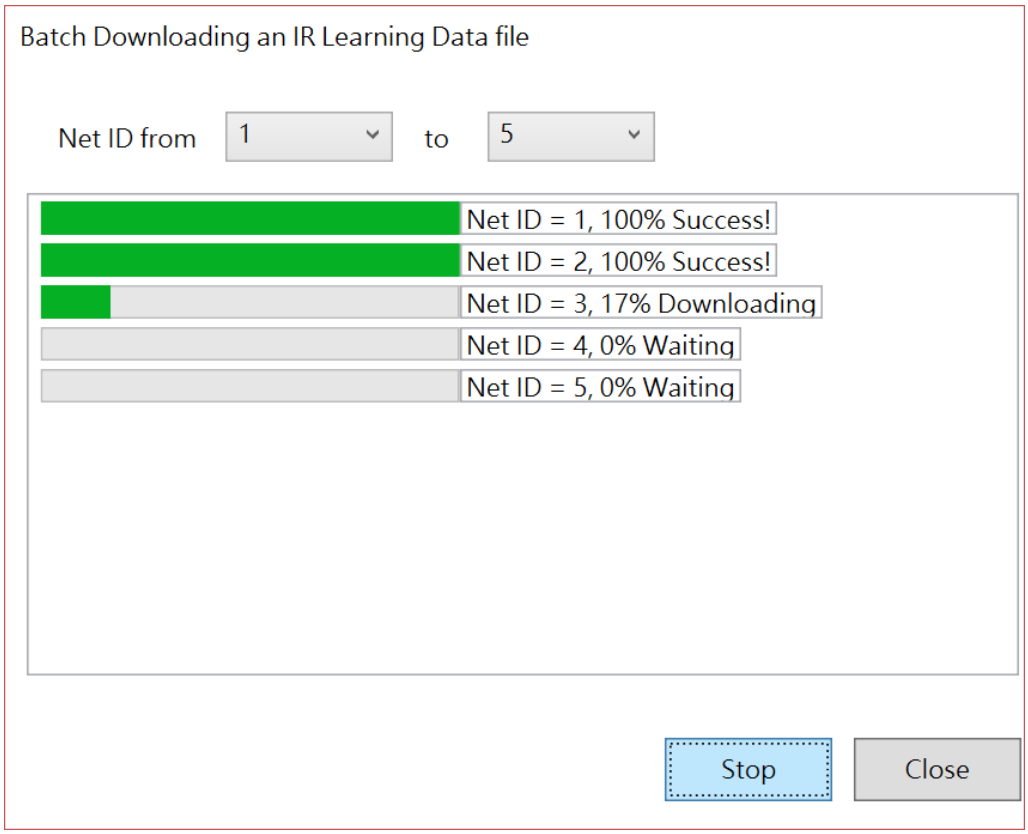
- After the IR learning process, save the IR learning commands to IR learning data files for backup.
  IR Utility => Menu [File] => [Save IR Commands to File]

- IR utility loads the IR learning data file.
  IR Utility => Menu [File] => [Load IR Commands from File]

- Download IR learning commands to an IR learning module.
  IR Utility => Menu [Download] => [Download IR Commands to IR-xxx]

- Batch-download an IR data file to multiple IR learning modules.

IR Utility => Menu [Download] => [Batch Download IR Commands to IR-xxx]
This is for multiple IR modules connected (multi-drop) to an RS-485 bus. Select the range of the Modbus Net ID and press the “Start” button in the following window to launch the process.



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Q13 : How to copy IR commands from other IR learning data files ?

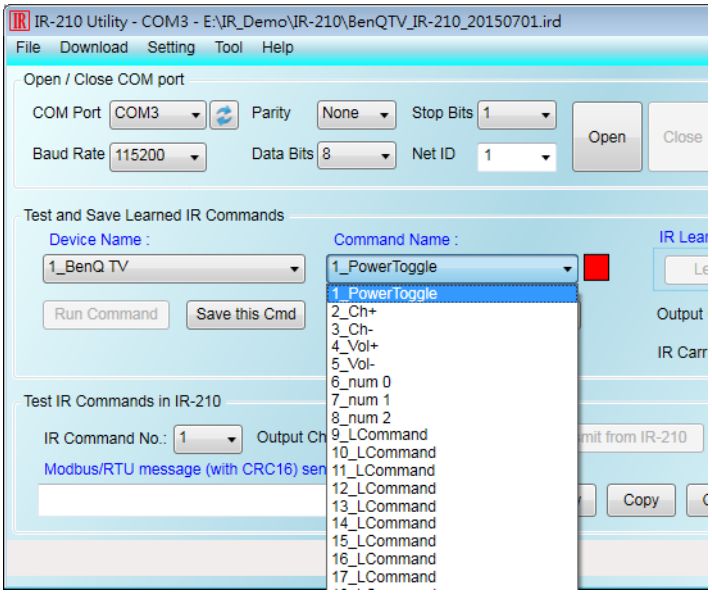
A13 :

The Copy-IR-Commands Function can avoid IR learning process again by copying the IR commands from the existing IR learning data files to the destination one.

※ Note: IR learning commands from IR-210 and IR-712A can be used interchangeably. The IR commands from IR-712-MTCP cannot be used by other modules.

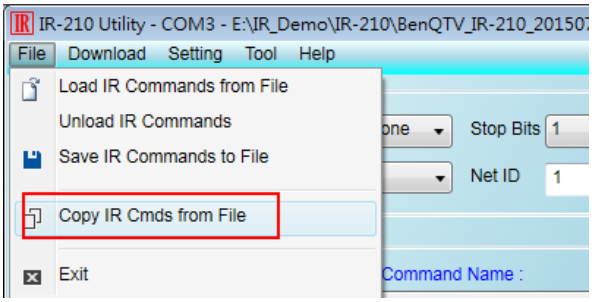
Steps:

a. IR utility loads the destination IR learning data file (e.g. “BenQTV_IR-210_20150701.ird”). Or, press the “Set Device & IR Command Quantity” button to add new device and configure IR commands quantity..



b. Open the copy IR commands window.

Select the item in the Menu [File] => [Copy IR Cmds from File].

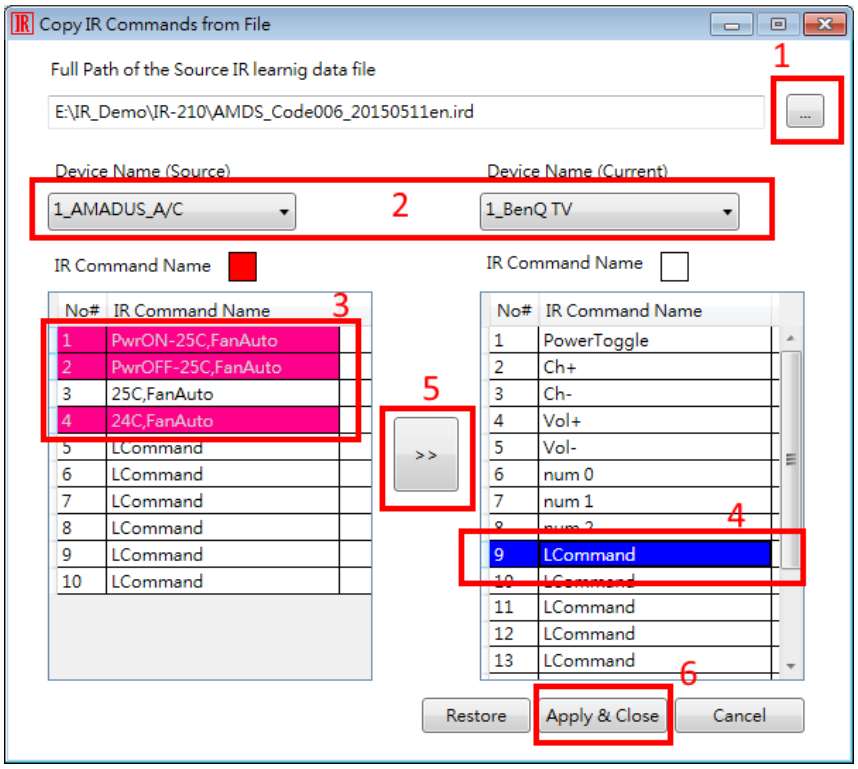


c. Steps of copying IR commands. Please refer the following figure, too.

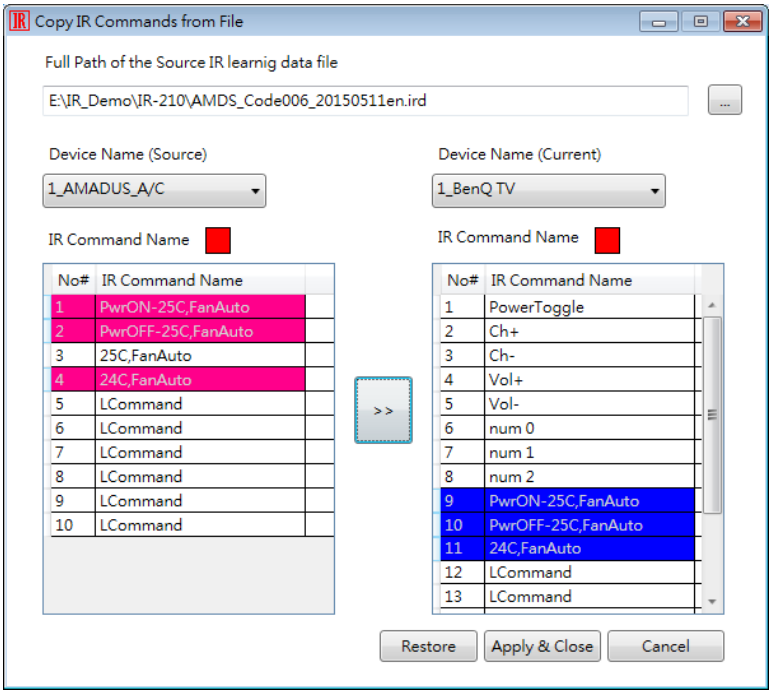
1. Browse & open the source IR learning data file. (e.g. “AMDS_Code006_20150511en.ird”)
2. Select the items of the source and current (destination) “Device Name” combobox.
3. Select the IR commands for copy in the source IR commands table (multi-selectable).
4. Select the start row in the current (destination) table (uni-selectable)
5. Press the “Copy” button “>>”. The items from the start row in the current table will be replaced with the copied IR commands.

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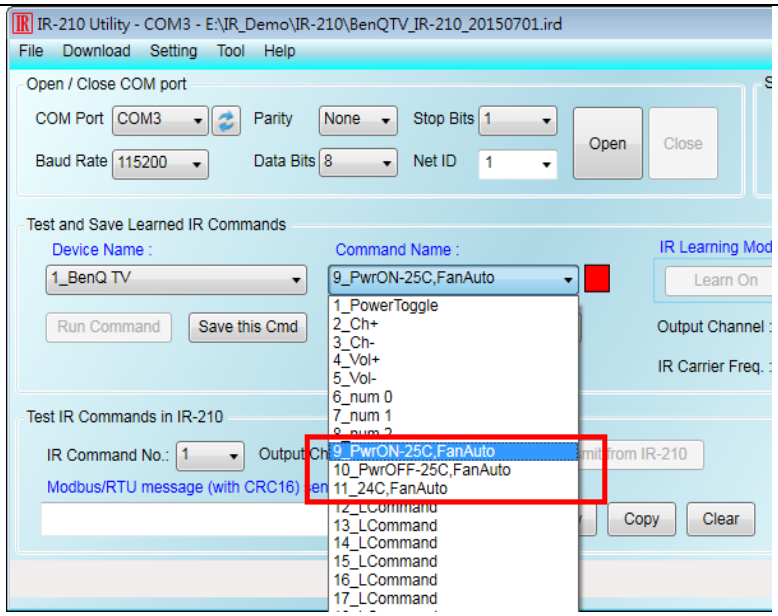
6. Press “Apply & Copy” button to finish copy.



The following figure shows the copy result:



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d. Save IR commands to the file.

Menu [File] => [Save IR Commands to File]

Q14 : Is there any IR API library?

A14 :

The IR API library supports the desktop application development on Microsoft Windows operation system. There are VC++ and C# library for programming. The IR API library supports IR-210/IR-72A/IR-712-MTCP.

Download link: ftp://ftp.icpdas.com.tw/pub/cd/usbcd/napdos/ir/software/library/windows/

Q15 : Is there any Modbus registers for IR learning and load/download IR data?

A15 :

Please refer to the link: http://www.icpdas.com/en/download/file.php?num=5230

Q16 : What's the difference between the IR cable CA-IR-SH2251 and CA-IR-SH2251-5?

A16 :

1. The diameter of the IRED (InfraRed-Emitting Diode) of the CA-IR-SH2251 is 3 mm. The diameter of the IRED of the CA-IR-SH2251-5 is 5 mm.
2. The emitting case volume of the CA-IR-SH2251-5 is 3 times larger than that of CA-IR-SH2251.
3. The wireless remote control distance of the CA-IR-SH2251-5 is approximately 10% longer than the CA-IR-SH2251.

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Q17 : Are there ASCII string commands to control emtting IR signal?

A17 :

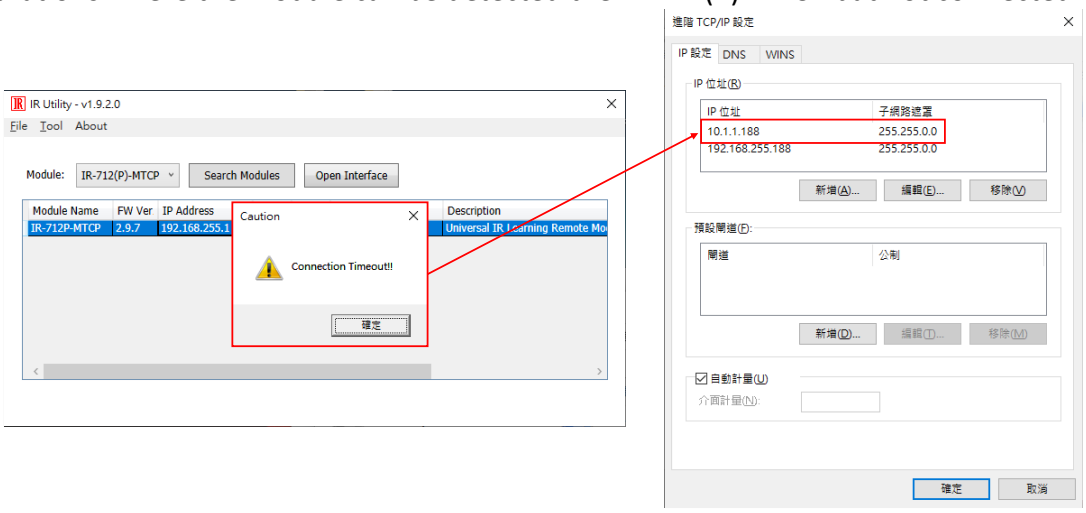
Besides the Modbus protocol commands, there are DCON protocol commands (ASCII string commands) to control emitting IR signals. This function is supported after the firmware version as follows:

IR-210: firmware version v2.00 and the later.
IR-712A: firmware version v2.00 and the later.
IR-712-MTCP: firmware version v2.6.0 and the later.

Q18 : IR Utility has identified the IR-712(P)-MTCP device, but it's unable to establish a connection. How to resolve the issue?

A18:

Please check if your computer has multiple IP configurations. If you have multiple IP configurations set up, make sure that the IP address within the same network segment as the IR-712(P)-MTCP device is configured as the primary one. The figure below illustrates multiple IP configurations where the module can be detected the IR-712(P)-MTCP but not connected.



The figure below shows the correct IP configuration where the IP address within the same network segment as the IR-712(P)-MTCP device is set as the first configuration.



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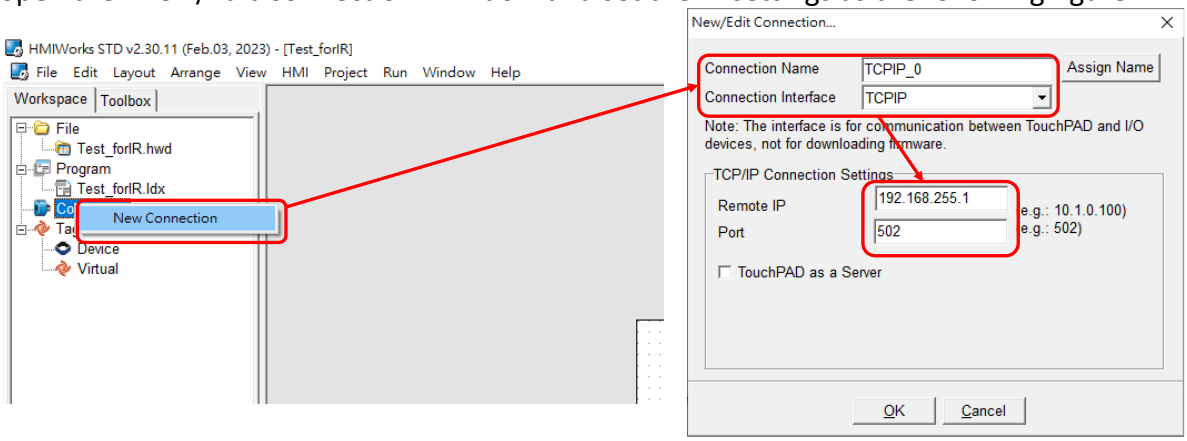
Q19 : How to use the Ladder language of TouchPAD with IR-712(P)-MTCP?

A19:

The following uses TPD-703 project to explain how to develop the TouchPAD project with ladder to realize the control on the IR-712-MTCP/IR-712P-MTCP.

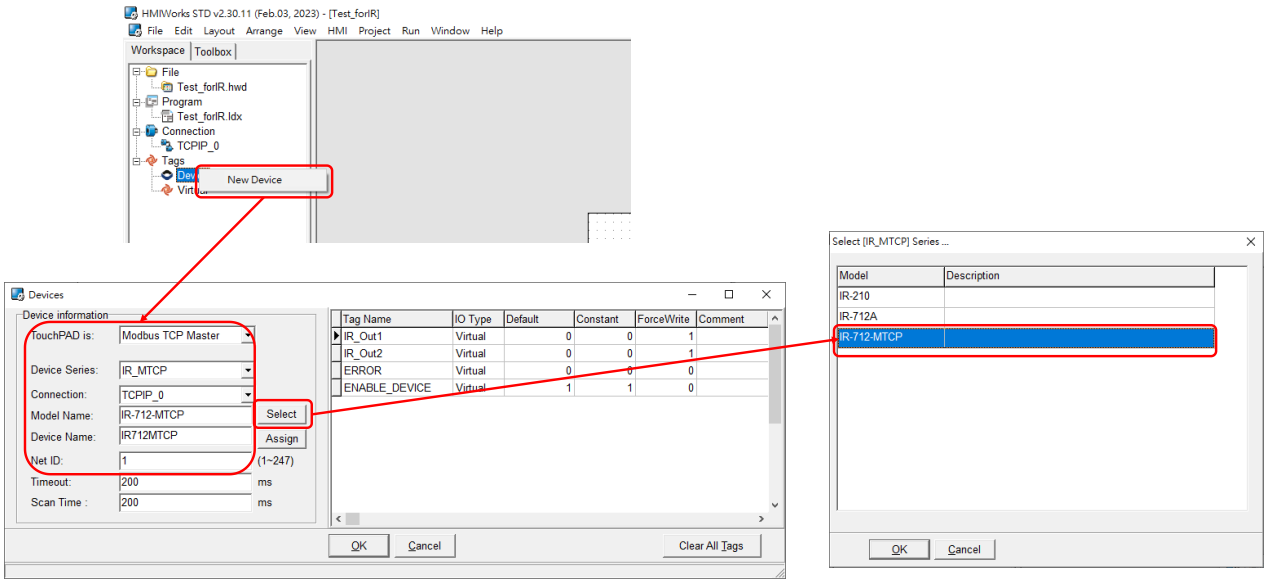
Steps:

1.Use mouse to right-click the “Connection” item in the Workspace tab. Select “New Connection” to open the “New/Edit Connection” window and set the IP settings as the following figure.



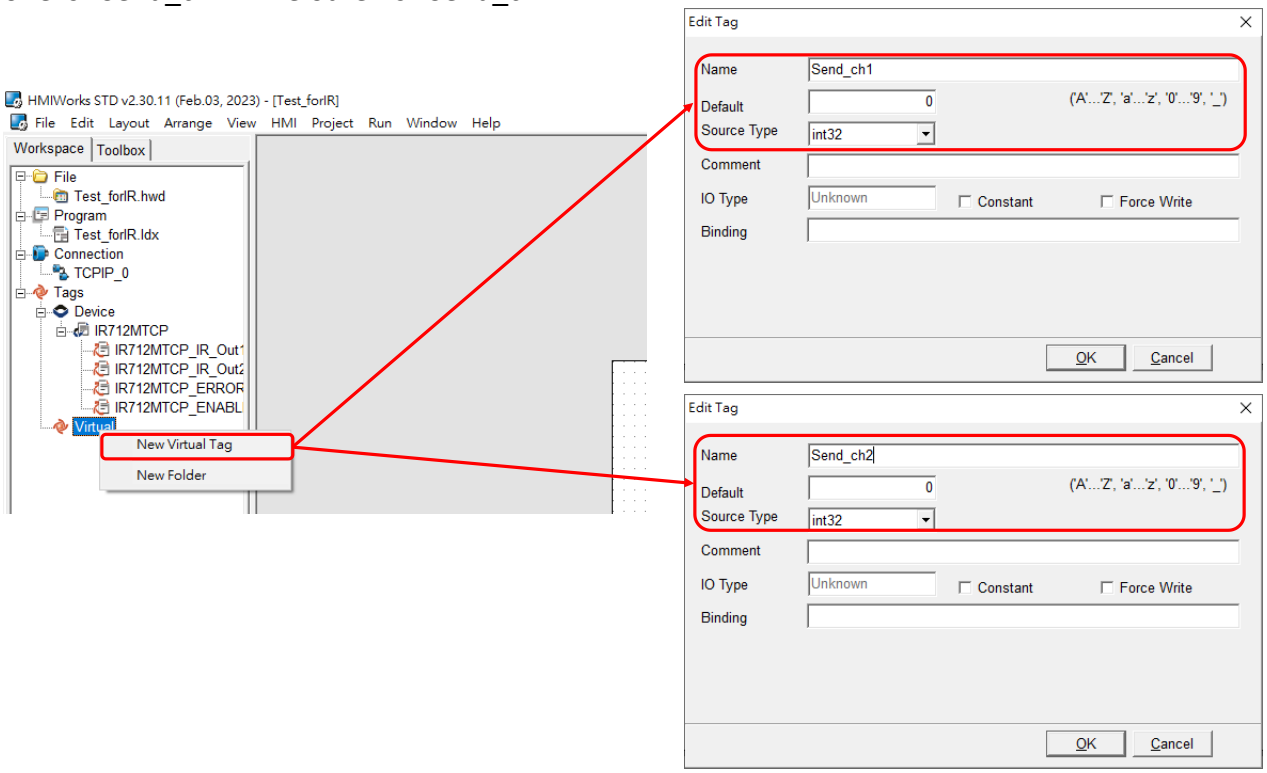
2. Mouse right-clicking the **Tag->Device** in the Workspace and select “New Device”. In the Device Information section of the Device window, set the parameters as follows:

TouchPAD is:	Modbus TCP Master
Device Series:	IR_MTCP
Connection:	TCP_0
Model Name:	IR-712-MTCP
Device Name:	(Device name of IR-712(P)-MTCP)
Net ID:	(Net ID of IR-712(P)-MTCP)

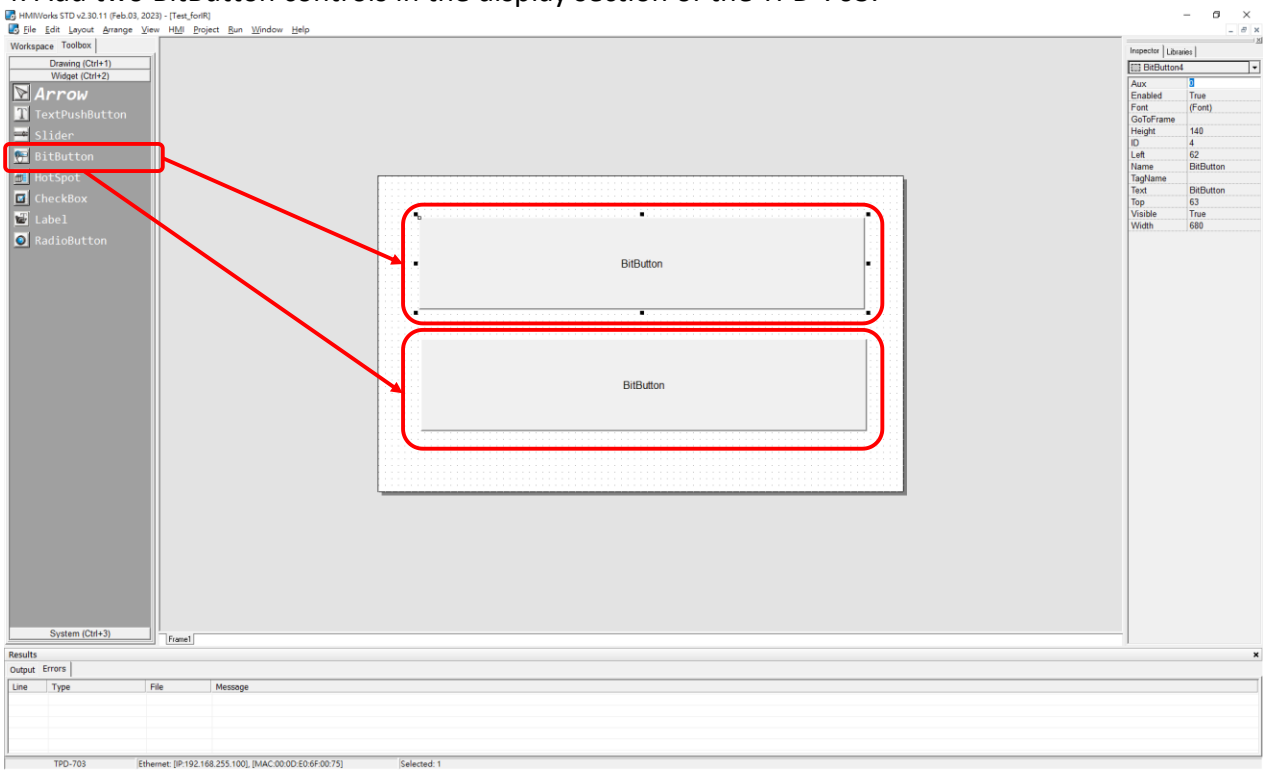


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3. Right-click the **Tags->Virtual** item and select the “New Virtual Tag” to add two **Send** Tags. The one is “Send_ch1”. The other is “Send_ch2”.

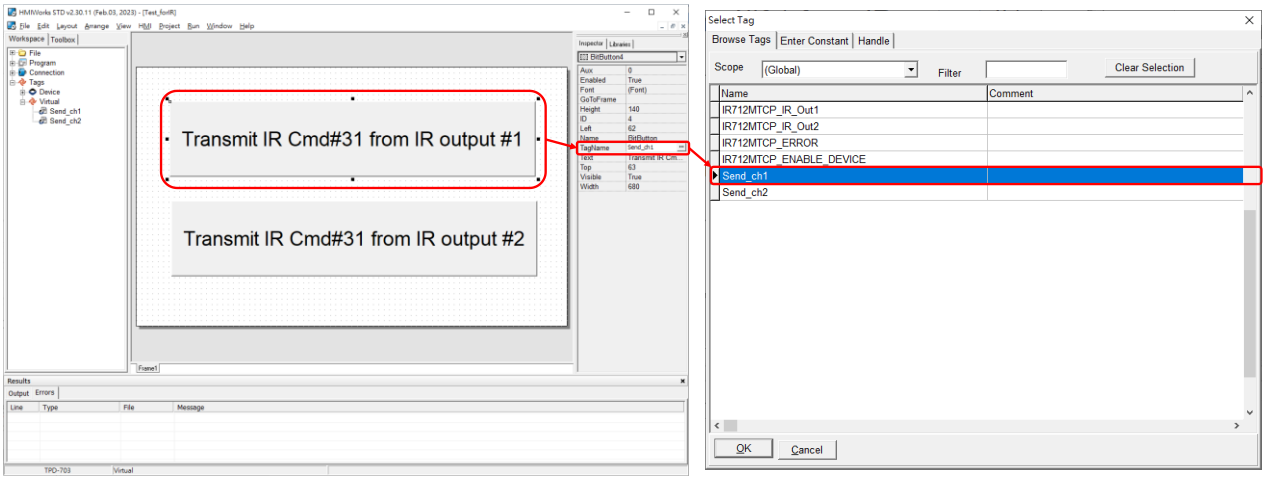


4. Add two BitButton controls in the display section of the TPD-703.

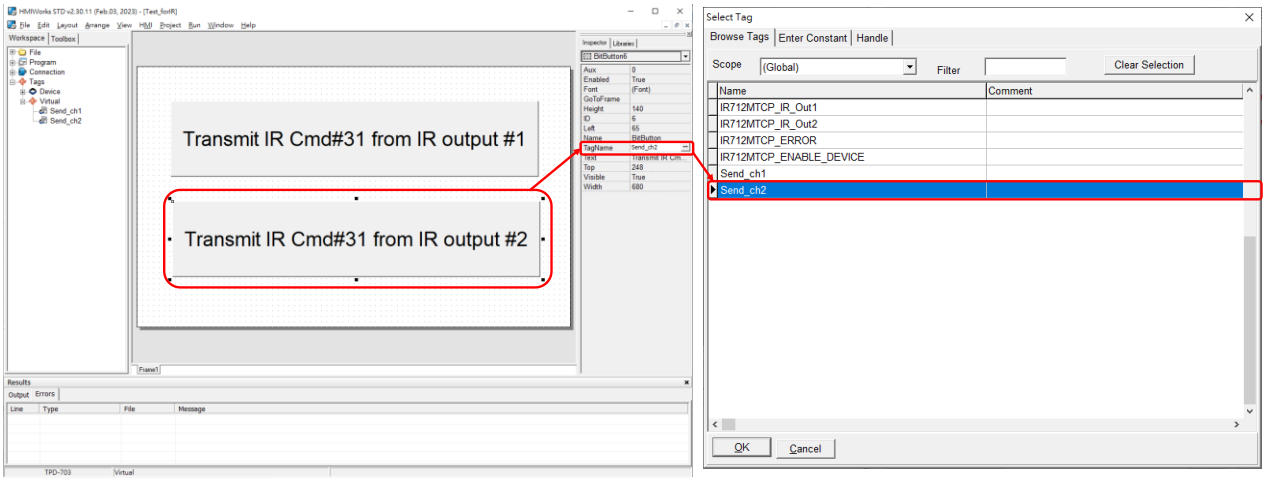


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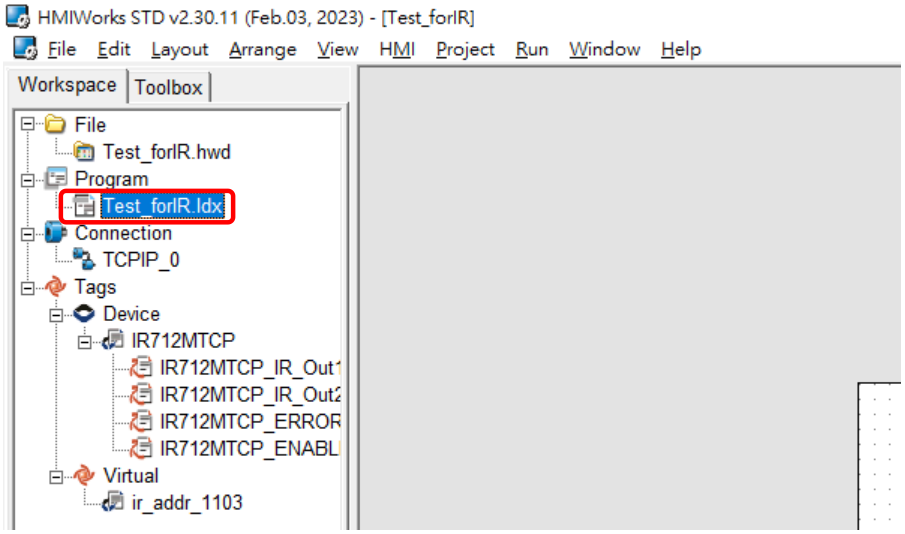
5. Set the BitButton1 TagName property on the button to "**Send_ch1**".



Set the BitButton2 TagName property on the button to "**Send_ch2**".

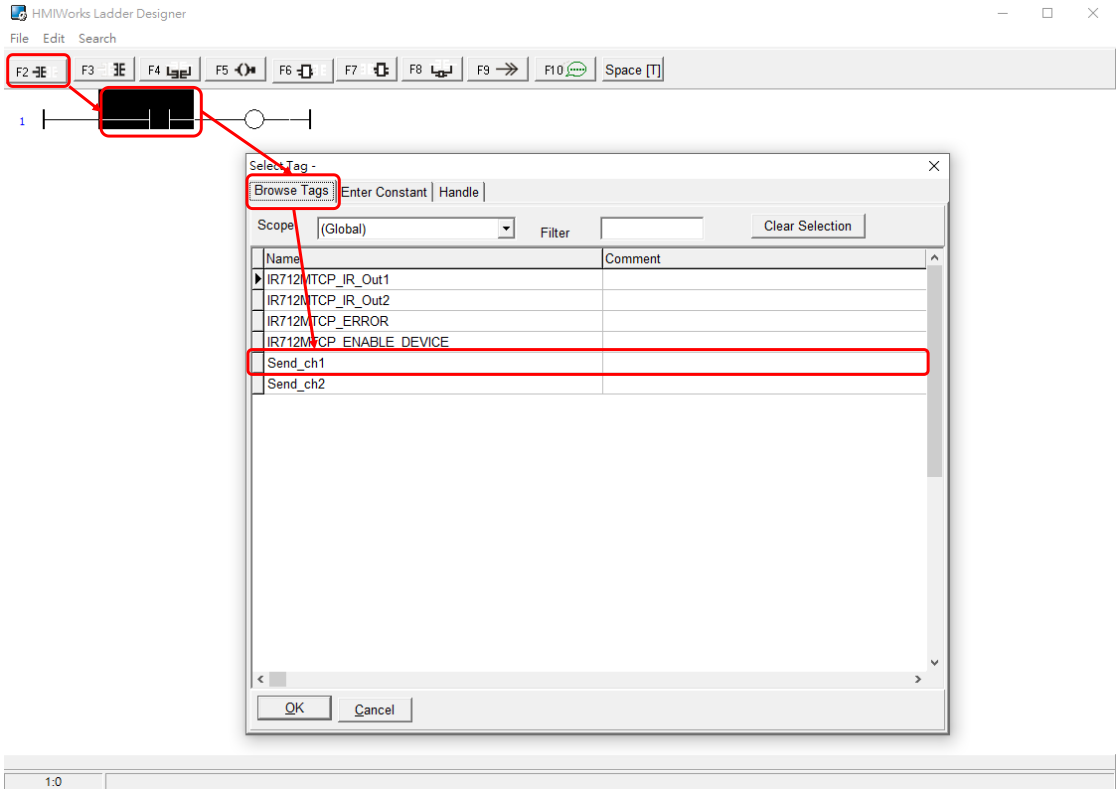


6. Open the "Program" item in the workspace and double-click the Idx file to open the HMIWorks Ladder Designer window.

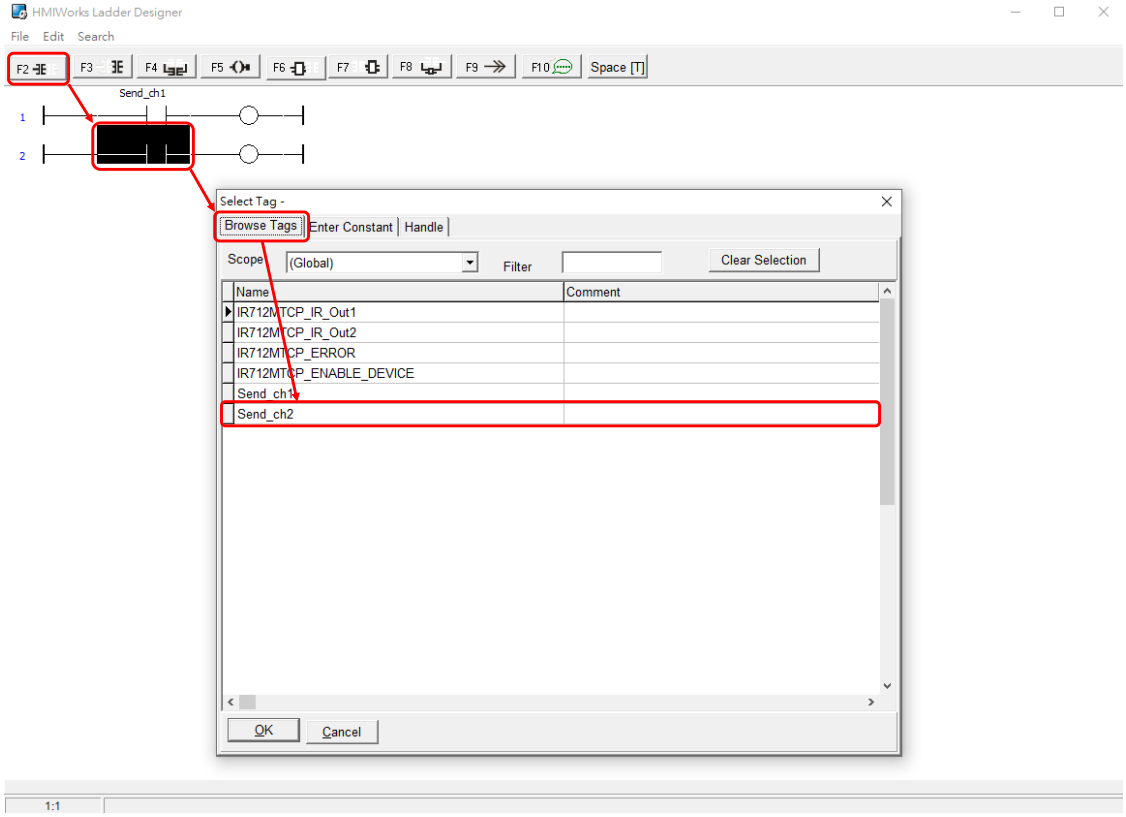


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7. Press F2 button to add a normally open contact. Double-click the normally open contact and set “**Send_ch1”** tag to the contact.

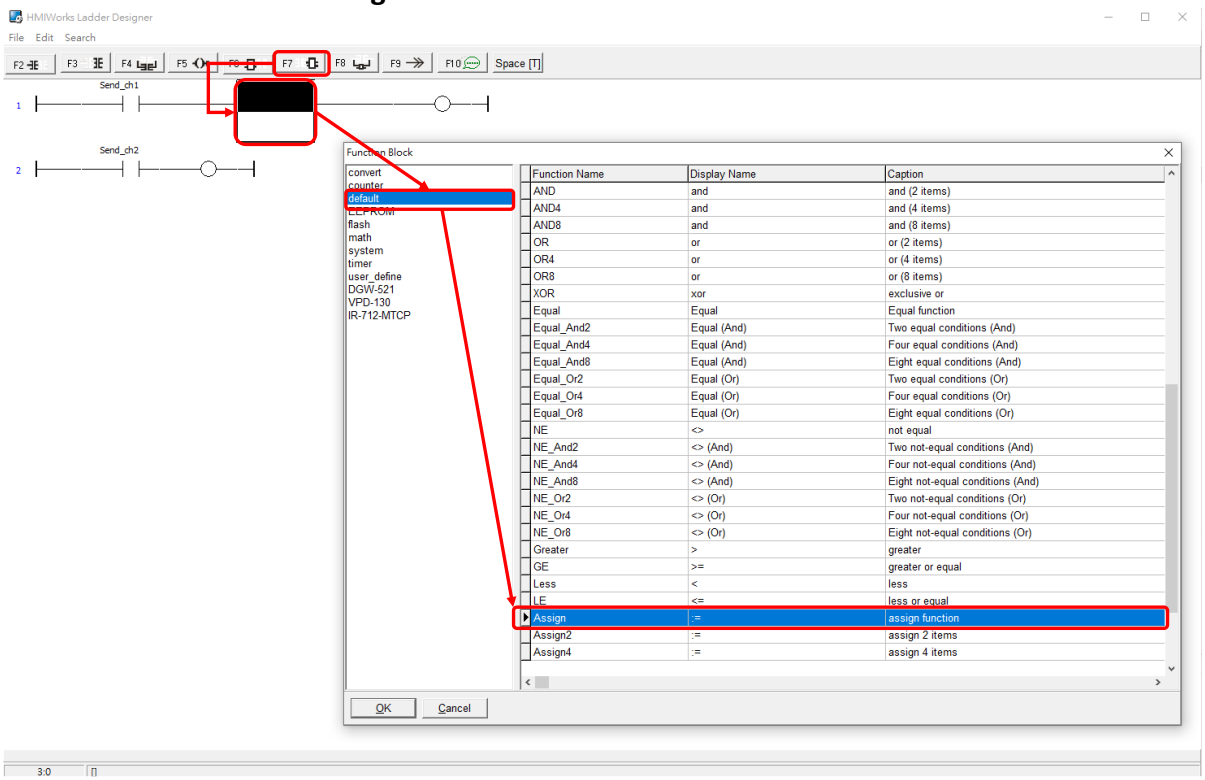


Press F2 button to add a normally open contact. Double-click the normally open contact and set “**Send_ch2”** tag to the contact.

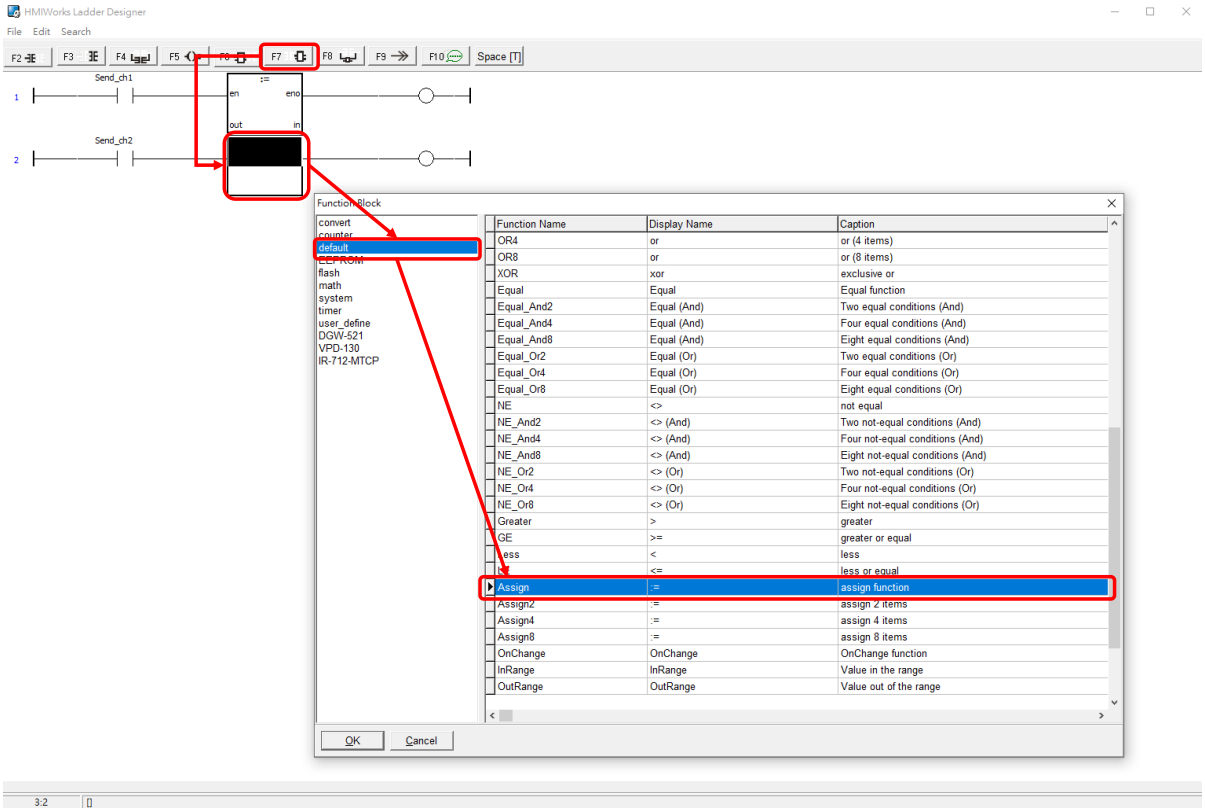


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8. Press F7 button to add an empty function block. Double-click the function block to open the window and select the "**Assign**" function in the "**default**" class.

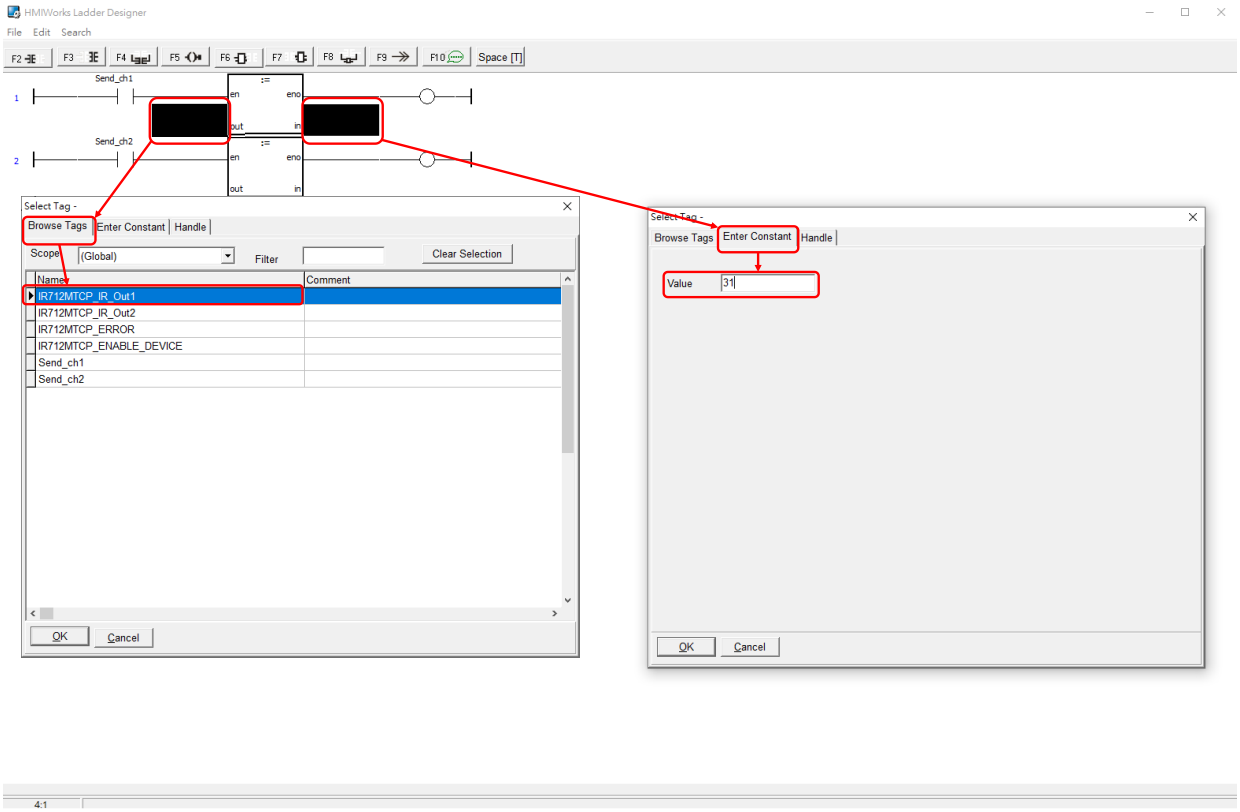


Press F7 button to add another empty function block. Double-click the function block to open the window and select the "**Assign**" function in the "**default**" class.

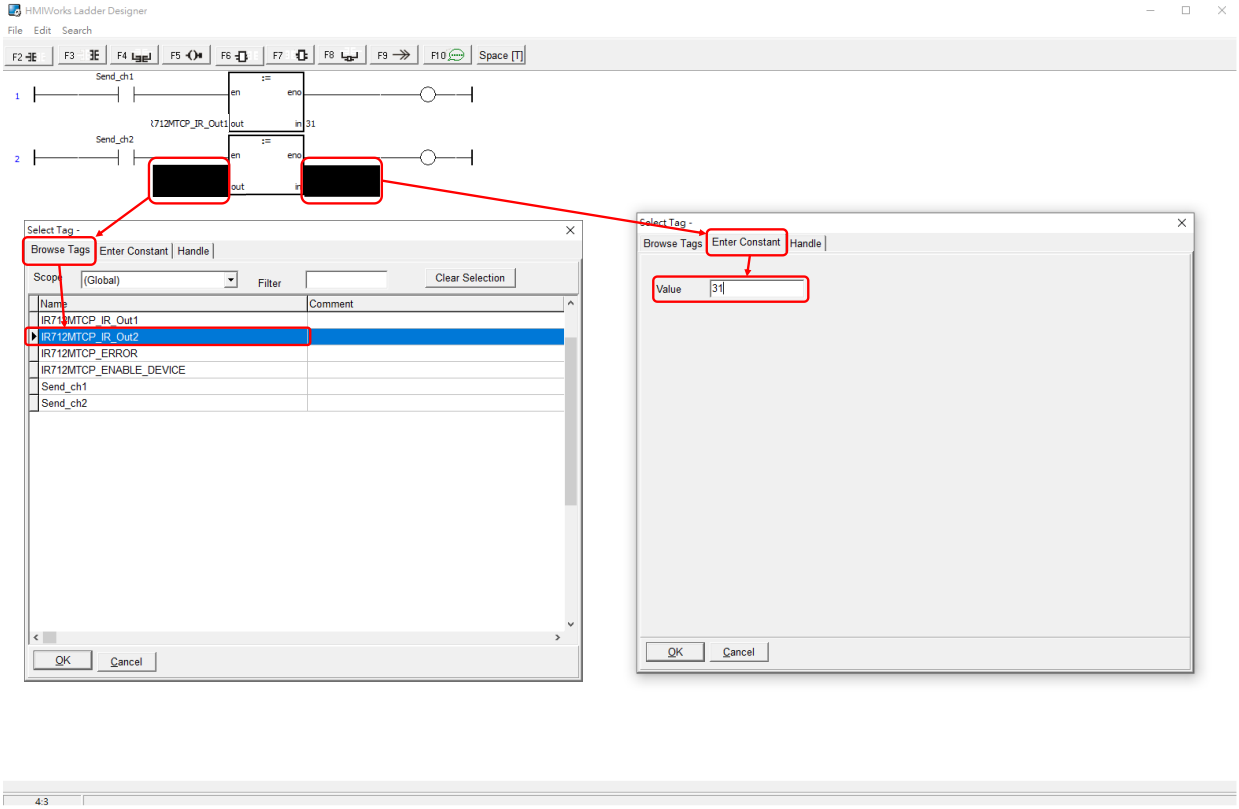


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9. Set the “in” and “out” of the “Assign” function block to “31” and “IR712MTCP_IR_Out1”. Where “31” mean IR command number 31. where “IR712MTCP_IR_Out1” means IR output channel 1.

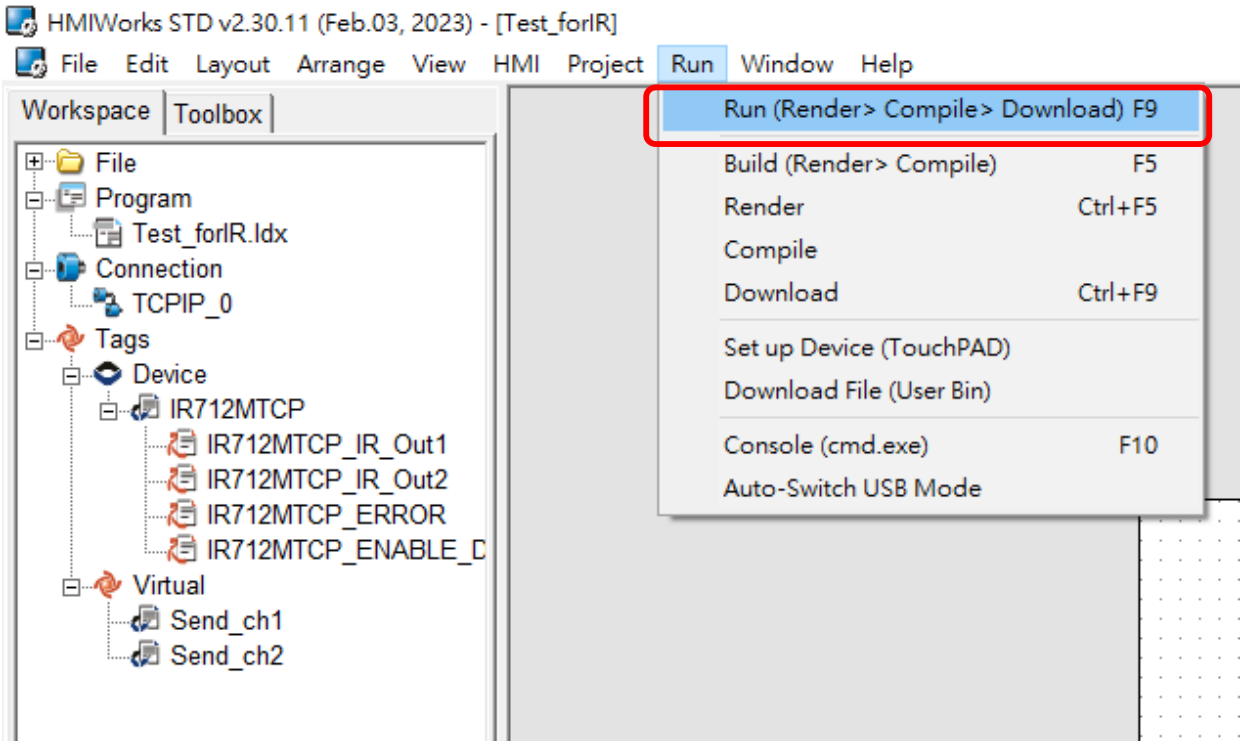


Set the “in” and “out” of the “Assign” function block to “31” and “IR712MTCP_IR_Out2”. Where “31” mean IR command number 31. where “IR712MTCP_IR_Out2” means IR output channel 2.



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10. Finally, press F9 key to compile and download project to the TouchPAD.



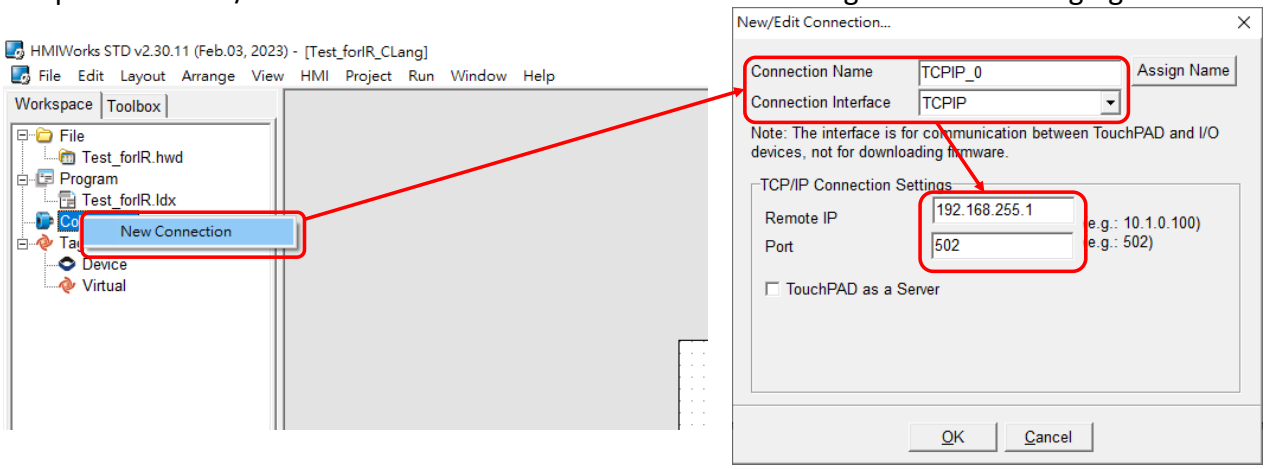
Q20 : How to use the C language of TouchPAD with IR-712(P)-MTCP?

A20:

The following uses TPD-703 project to explain how to develop the TouchPAD project with C language to realize the control on the IR-712-MTCP/IR-712P-MTCP.

Steps:

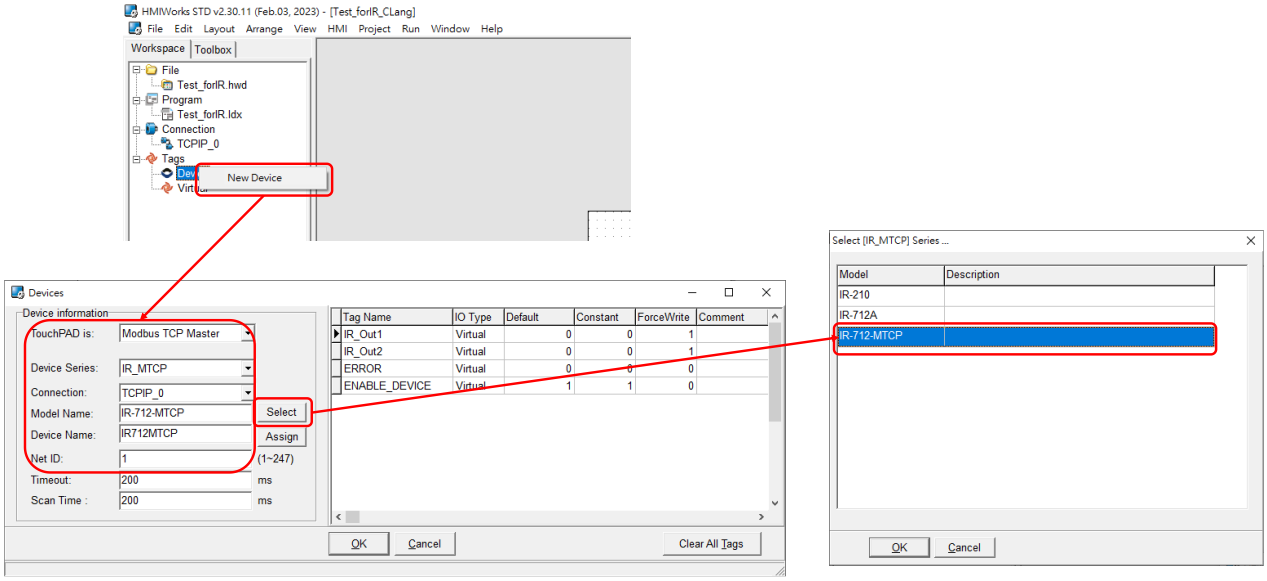
1.Use mouse to right-click the “Connection” item in the Workspace tab. Select “New Connection” to open the “New/Edit Connection” window and set the IP settings as the following figure.



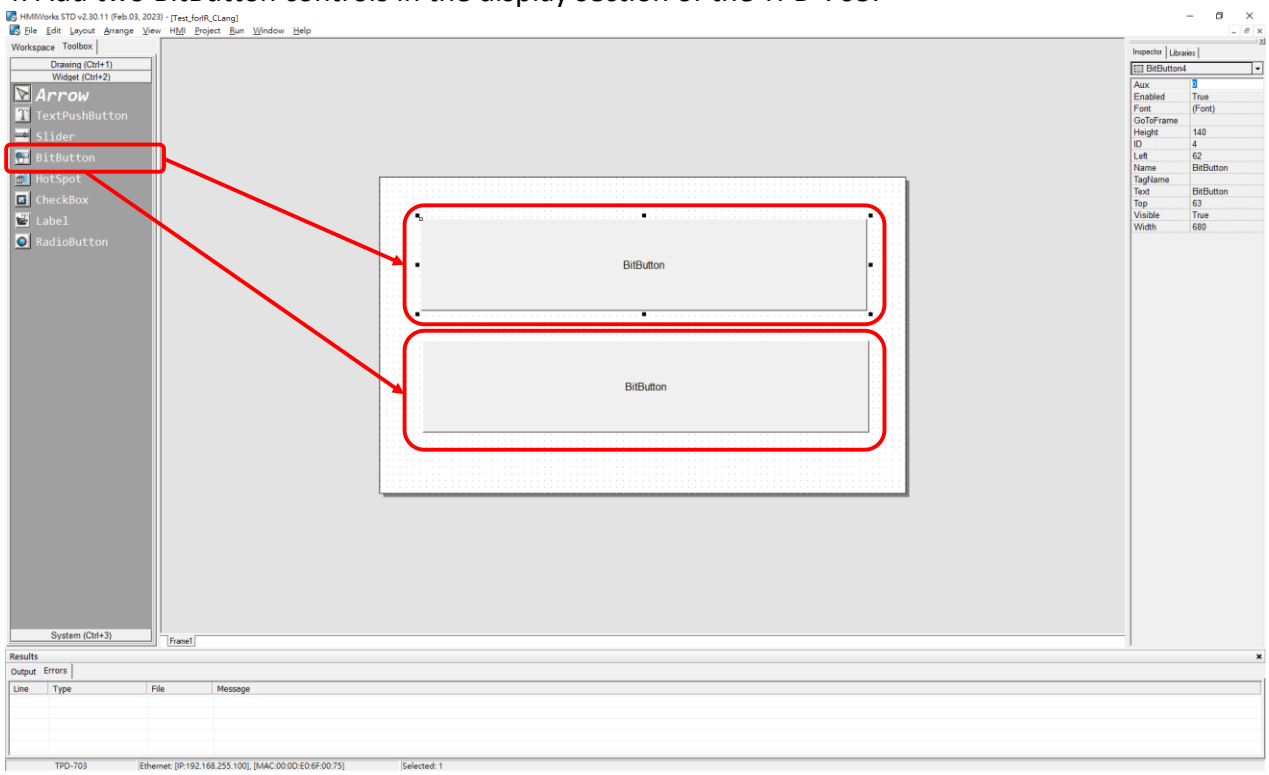
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2. Mouse right-clicking the **Tag->Device** in the Workspace and select “New Device”. In the Device Information section of the Device window, set the parameters as follows:

TouchPAD is:	Modbus TCP Master
Device Series:	IR_MTCP
Connection:	TCP_0
Model Name:	IR-712-MTCP
Device Name:	(Device name of IR-712(P)-MTCP)
Net ID:	(Net ID of IR-712(P)-MTCP)

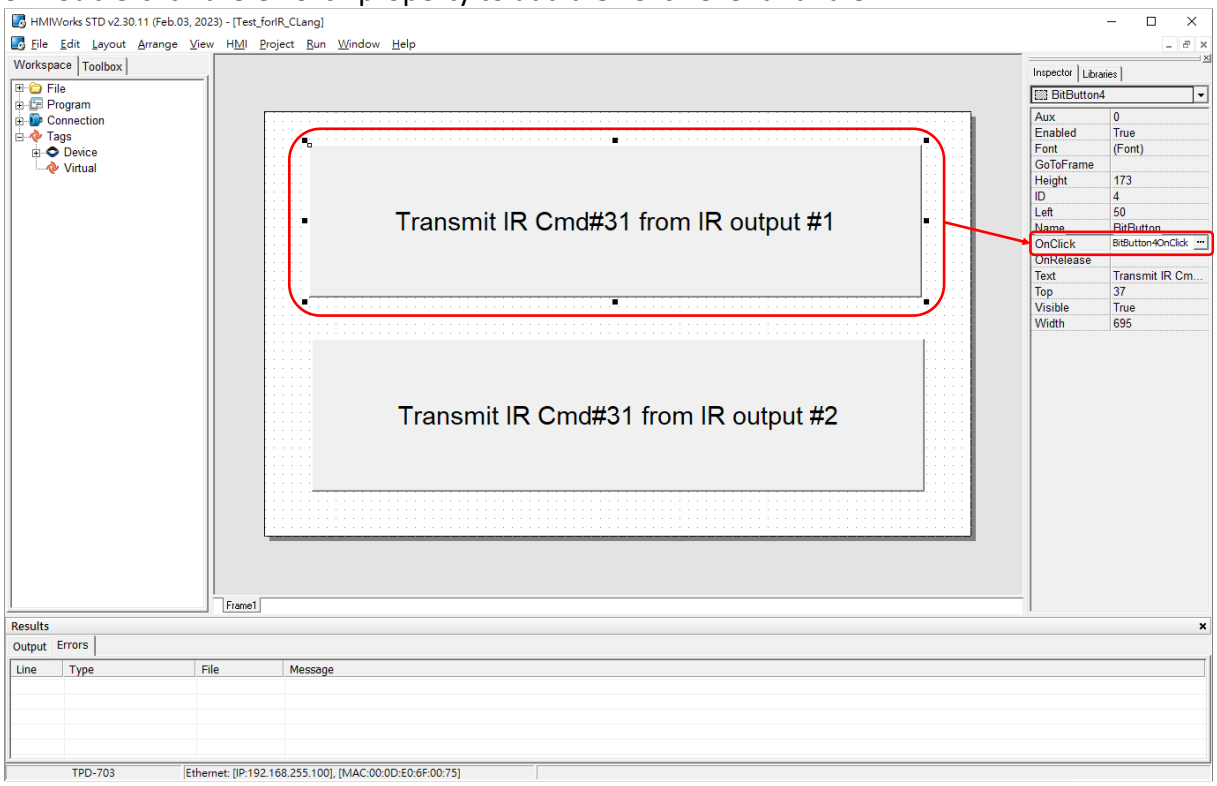


4. Add two BitButton controls in the display section of the TPD-703.

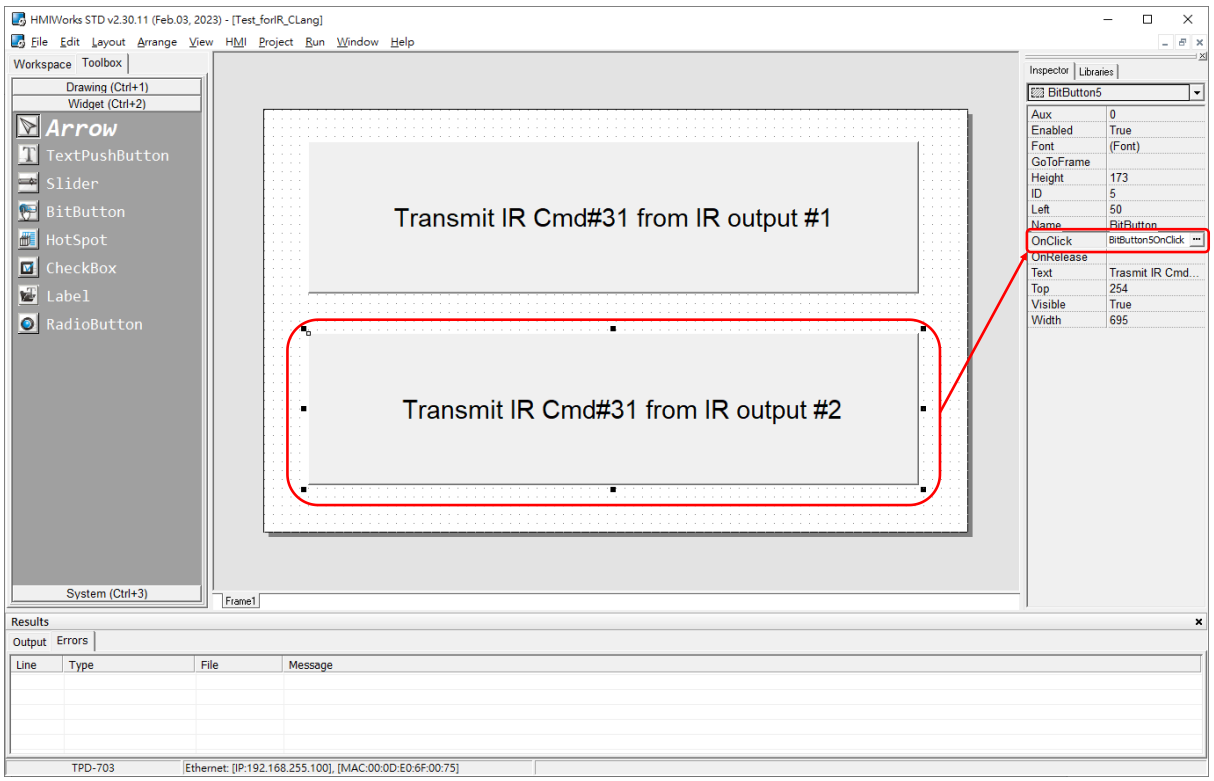


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5. Double-click the OnClick property to add a OnClick event handler.



Double-click the OnClick property to add a OnClick event handler.

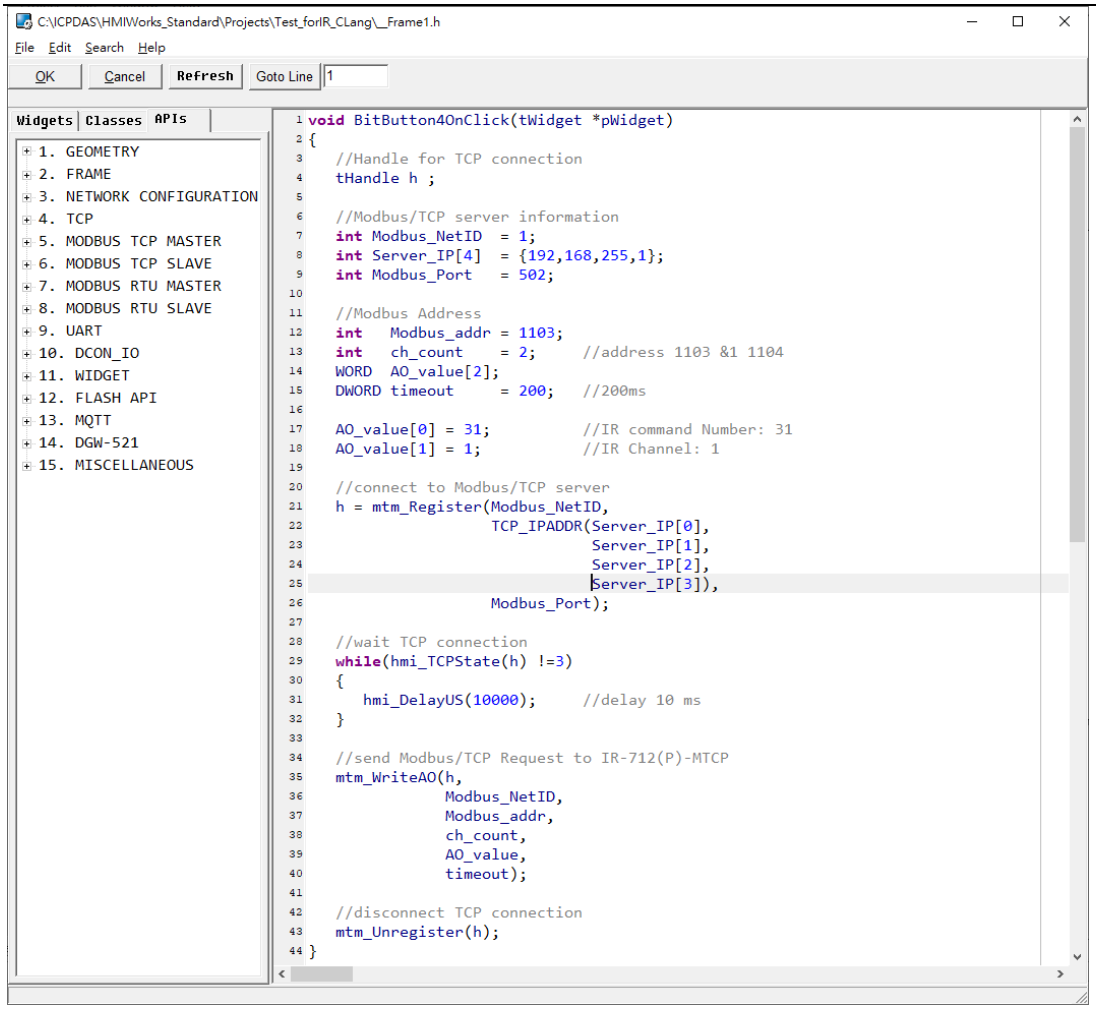


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6. Copy the following C code to the OnClick event handler. It sends Modbus command to IR-712(P)-MTCP with IR output channel 1 and write data to address 1103(IR command number) and 1104(IR output channel) of holding registers.

```
1. void BitButton4OnClick(tWidget *pWidget)
2. {
3.    //Handle for TCP connection
4.    tHandle h ;
5.
6.    //Modbus/TCP server information
7.    int Modbus_NetID  = 1;
8.    int Server_IP[4]  = {192,168,255,1};
9.    int Modbus_Port   = 502;
10.
11.   //Modbus Address
12.   int   Modbus_addr = 1103;
13.   int   ch_count    = 2;     //address 1103 & 1104
14.   WORD  AO_value[2];
15.   DWORD timeout     = 200;   //200ms
16.
17.   AO_value[0] = 31;          //IR command Number: 31
18.   AO_value[1] = 1;           //IR Channel: 1
19.
20.   //connect to Modbus/TCP server
21.   h = mtm_Register(Modbus_NetID,
22.                    TCP_IPADDR(Server_IP[0],
23.                               Server_IP[1],
24.                               Server_IP[2],
25.                               Server_IP[3]),
26.                    Modbus_Port);
27.
28.   //wait TCP connection
29.   while(hmi_TCPState(h) !=3)
30.   {
31.      hmi_DelayUS(10000);     //delay 10 ms
32.   }
33.
34.   //send Modbus/TCP Request to IR-712(P)-MTCP
35.   mtm_WriteAO(h,
36.               Modbus_NetID,
37.               Modbus_addr,
38.               ch_count,
39.               AO_value,
40.               timeout);
41.
42.   //disconnect TCP connection
43.   mtm_Unregister(h);
44.}
```


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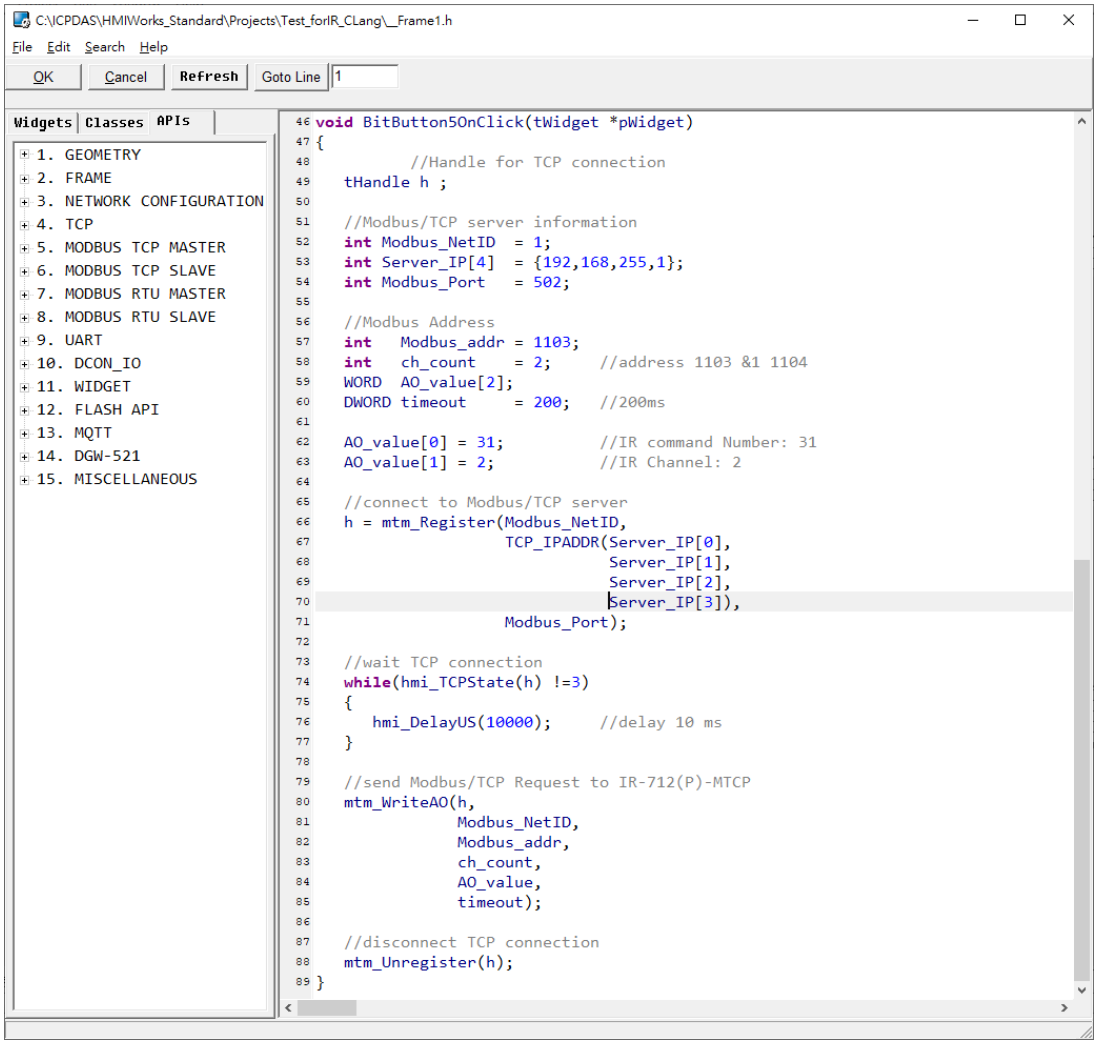


Copy the following C code to the OnClick event handler. It sends Modbus command to IR-712(P)-MTCP with IR output channel 2 and write data to address 1103(IR command number) and 1104(IR output channel) of holding registers.

```
46. void BitButton5OnClick(tWidget *pWidget)
47. {
48.    //Handle for TCP connection
49.    tHandle h ;
50.
51.    //Modbus/TCP server information
52.    int Modbus_NetID  = 1;
53.    int Server_IP[4]  = {192,168,255,1};
54.    int Modbus_Port   = 502;
55.
56.    //Modbus Address
57.    int   Modbus_addr = 1103;
58.    int   ch_count    = 2;     //address 1103 & 1104
59.    WORD  AO_value[2];
60.    DWORD timeout     = 200;   //200ms
61.
62.    AO_value[0] = 31;          //IR command Number: 31
63.    AO_value[1] = 2;           //IR Channel: 2
64.
65.    //connect to Modbus/TCP server
66.    h = mtm_Register(Modbus_NetID,
67.                     TCP_IPADDR(Server_IP[0],
```

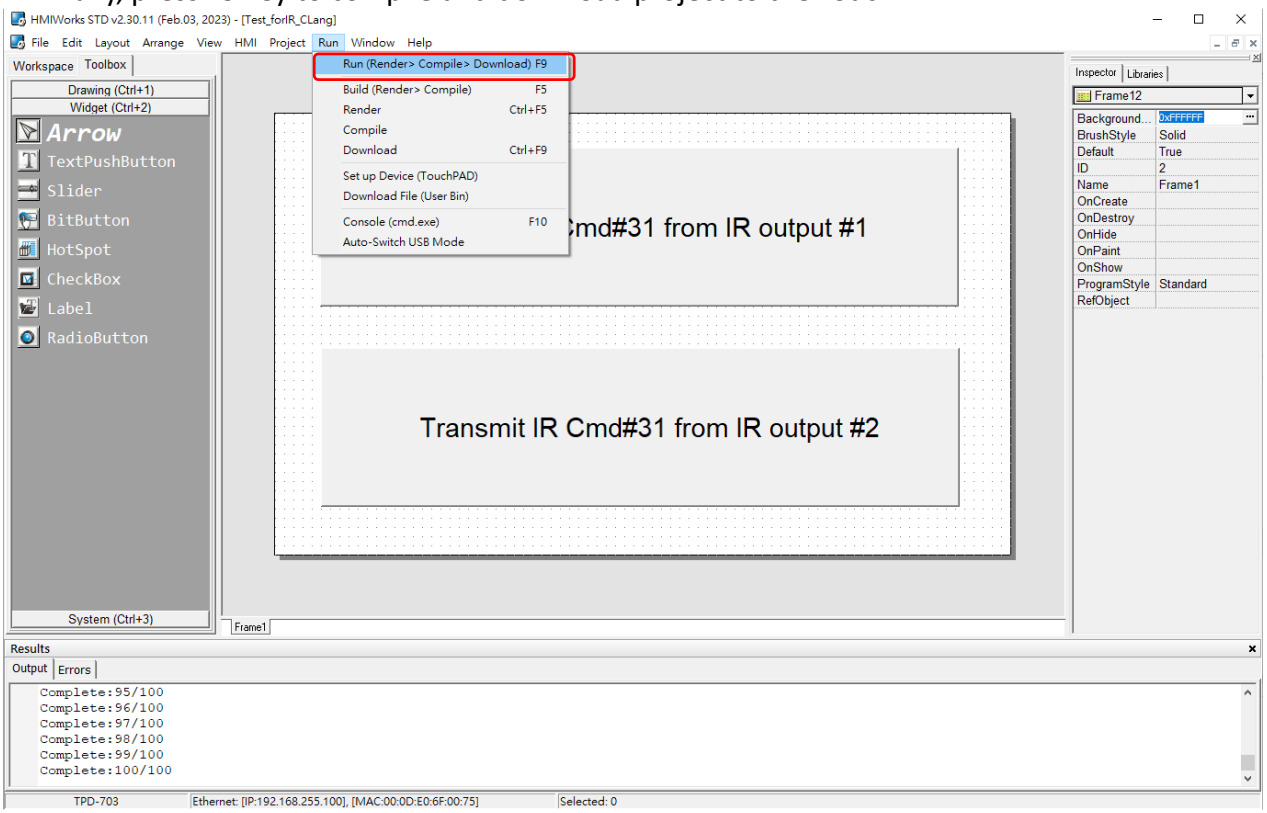

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```
68.                                 Server_IP[1],
69.                                 Server_IP[2],
70.                                 Server_IP[3]),
71.                       Modbus_Port);
72.
73.    //wait TCP connection
74.    while(hmi_TCPState(h) !=3)
75.    {
76.       hmi_DelayUS(10000);     //delay 10 ms
77.    }
78.
79.    //send Modbus/TCP Request to IR-712(P)-MTCP
80.    mtm_WriteAO(h,
81.                Modbus_NetID,
82.                Modbus_addr,
83.                ch_count,
84.                AO_value,
85.                timeout);
86.
87.    //disconnect TCP connection
88.    mtm_Unregister(h);
89. }
```



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4. Finally, press F9 key to compile and download project to the TouchPAD.



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